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ABSTRACT

The interest-based curriculum materials are designed to correlate the subjects of English, math, science, and home economics in an effort to infuse academic skills into the world of work. The curriculum guide is designed for mathematics curriculum and is divided into 11 sections: orientation, whole numbers, common fractions, decimal fractions, percents, units of measure and measurement, the metric system, ratio and proportion, introduction to algebra and geometry, and personal business. The learning activities include: class work, inquiry team approach, discussion, displays, lectures, filmstrips, tests, and personal banking and tax procedures and forms. A bibliography completes the document. Each section is organized around objectives, activities, evaluative material (teacher and student), and instructional materials. (JB)

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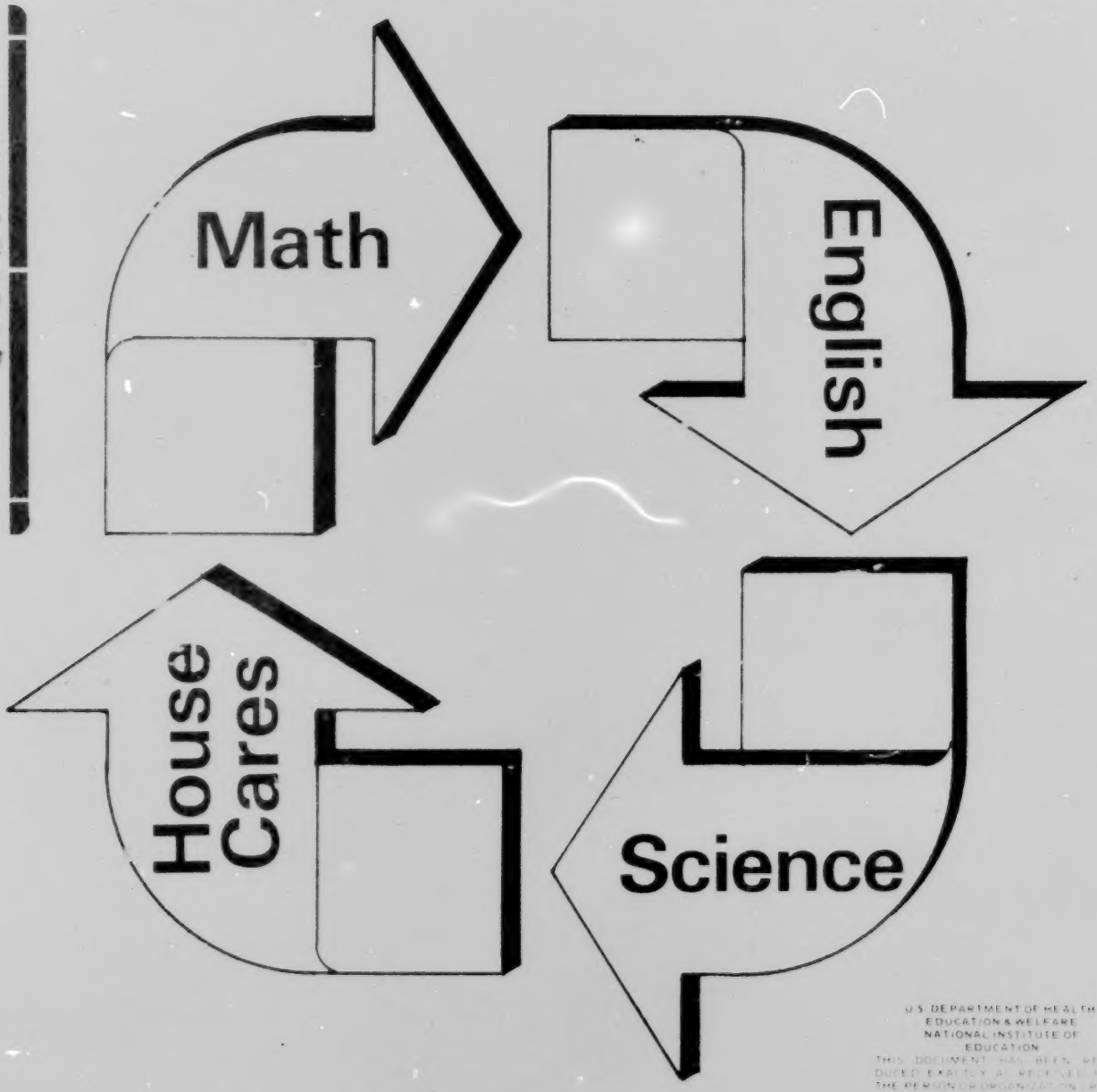
NTEREST-BASED CURRICULUM

FOR

HOUSE CARE SERVICES

ED107811



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MATH

TABLE OF CONTENTS

Introduction i

Foreword ii

UNIT I: ORIENTATION

Objectives 1
Instructional Materials 5

UNIT II: WHOLE NUMBERS

Objectives 8
Activities 11
Evaluative Material 19
Instructional Materials 22

UNIT III: COMMON FRACTIONS

Objectives 24
Activities 30
Evaluative Material 40
Instructional Materials 43

UNIT IV: DECIMAL FRACTIONS

Objectives 46
Activities 49
Evaluative Material 65
Instructional Materials 68

UNIT V: PERCENTS

Objectives 71
Activities 74
Evaluative Material 83
Instructional Materials 86

UNIT VI: UNITS OF MEASURE AND MEASUREMENT

Objectives 89
Activities 92
Evaluative Material 110
Instructional Materials 112

UNIT VII: METRIC SYSTEM

Objectives 114
Activities 116
Evaluative Material 128
Instructional Materials 130

UNIT VIII: RATIO AND PROPORTION

Objectives 132
Activities 133
Evaluative Material 138
Instructional Materials 140

UNIT IX: INTRODUCTION TO ALGEBRA

Objectives 142
Activities 145
Evaluative Material 184
Instructional Materials 186

UNIT X: GEOMETRY

Objectives 189
Activities 192
Evaluative Material 227
Instructional Materials 229

UNIT XI: PERSONAL BUSINESS

Objectives 233
Activities 234
Evaluative Material 252
Instructional Materials 254

BIBLIOGRAPHY 257

INTRODUCTION

The interest-based curriculum materials are designed to correlate the subjects of English, math, science, and home economics in an effort to make education more interesting and relevant to the Natchitoches Parish students. Objectives of the curriculum guides are divided into four categories. They are: (1) Program Objectives; (2) Performance Objectives; (3) Process Objectives; and (4) Activities. The three numbers in sequence separated by a dash represent the performance objective, process objective, and activity respectively. This method of identification allows for easy monitoring of the objectives on the monitorial sheet after each unit. An abundance of instructional materials can be used in conjunction with the interest-based curriculum. It is only designed to be a guide for infusing the academic skills into the everyday world of work. The interest-based curriculum guides were developed under the direction of John Vandersypen, Site Coordinator of an Exemplary Program for Career Education, during the 1973-74 school year.

The following classroom teachers participated in the development of these materials:

Sylvia Brown - English
Evelyn Gair - Home Economics
Patsy Johnson - Home Economics
Eliza Jones - Math
Annie Reed - Home Economics
Fred Sullivan - Science

Project No. V361047
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An Exemplary Program For Career Education

Exemplary Project in Vocational Education
Conducted Under
Part D of Public Law 90-576

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John J. Vandersypen, Jr.
Natchitoches Parish School Board
Box 16
Natchitoches, Louisiana 71457

April 1974

UNIT I
ORIENTATION
House Care Services

1-0-0 Upon completion of this unit the house care service students will understand and appreciate the necessity of mathematics in various house care services.

1-1-0 By use of lecture, filmstrip, and questionnaire, the house care services teacher will give an understanding of the different services involved in house care.

1-1-1 Lecture and discussion of bulletin board display on house care services

1-1-2 Filmstrips - "A New Look at Home Economic Careers" and "Why Work at All"

1-1-3 Guest speaker (preferably a local home economics teacher familiar with different house care services)

1-1-4 Questionnaire on house care services

1-2-0 By the use of library resources, field trips, and visits with service workers, the house care services students and teacher will discuss how mathematics is an integral and necessary part of each service (see 1-2-0)

1-2-1 Inquiry team approach

1-2-2 General class discussion

1-2-3 Evaluation - rate reports and observe interest shown by students

* This unit is designed to be incorporated intermittently throughout the first nine weeks for the purpose of motivating and encouraging students to work to their fullest capacity in mathematics. Other activities may be added as needs arise.

1-1-4 Questionnaire

What Would You Like To Be?

The following is a list of occupations related to house care services. If you are interested in other related occupations, please add them at the end of the list. Circle the appropriate number for each occupation.

(1) not interested (2) slightly interested

(3) moderately interested (4) most interested

(1)	Visiting Homemakers	1	2	3	4
(2)	Emergency Housekeeper	1	2	3	4
(3)	Maids (hotel, motel, hospitals, etc.)	1	2	3	4
(4)	Supervisors (hotels, motels, etc.)	1	2	3	4
(5)	Domestic Engineer	1	2	3	4
(6)	Janitor	1	2	3	4
(7)	Custodians - maids in schools	1	2	3	4
(8)	Laundry Services	1	2	3	4
(9)	Assistant House Manager	1	2	3	4
(10)	Domestic Engineer (Housekeeper)	1	2	3	4
(11)	Landscape Architect	1	2	3	4
(12)	Florist Assistant	1	2	3	4
(13)	Floor Care Specialist	1	2	3	4
(14)	Furniture Refinisher	1	2	3	4
(15)	Carpet Specialist	1	2	3	4
(16)	Upholsterer	1	2	3	4
(17)	Appliance Demonstrator	1	2	3	4
(18)	Maintenance Engineer	1	2	3	4
(19)	Interior Decorator	1	2	3	4
(20)	Draperies and Curtains Specialist	1	2	3	4
(21)	Small Appliance Repairer	1	2	3	4
(22)	Business Manager (hotels, motels, etc.)	1	2	3	4

1-2-0 Guide for Studying a Particular House Care Service

I. Description of the service
   A. Its importance
   B. Nature of the service
   C. Duties and responsibilities
   D. Tools, machines, and equipment used

II. Employment outlook and trends
   A. Current employment outlook
   B. Long range outlook and trends
   C. Current local employment outlook and trends
   D. Factors affecting employment outlook and trends

III. Qualification for the service
   A. Age
   B. Sex
   C. Personal qualifications - physical, mental, and emotional
   D. Special skills, abilities and interests
   E. Special licenses, examinations, and other requirements

IV. Preparation for the service
   A. General level of education required
   B. Special training and higher education required
      1. Institutions offering such training
      2. Length of program
      3. Type of program
      4. Costs
   C. Experience requirements

V. Entrance into and advancement in the service
   A. Methods of entering
   B. Entry jobs

VI. Working conditions
   A. Typical place of employment
   B. Hours of work
   C. Regularity of employment
   D. Health and accident hazards

VII. Wages and other benefits
   A. Wage range: beginning, average, and top
   B. Vacations
   C. Health, pension, and insurance plans

VIII. Summary of the service
   A. Advantages and disadvantages
   B. Other information needed
   C. Personal assessment of the occupation

1-2-1 Inquiry Team Approach

The following are merely some suggested procedures. The teacher may alter this procedure as he sees fit and should use his imagination and originality in planning this study.

I. The class should be divided into teams, each consisting of four students. (Numbers on teams may vary, depending upon class size.)

II. Each team should select at least three services to explore.

III. Each team should prepare a written report on all the services they select. (See 1-2-0) This should include information from personal interviews, visits to house care service institutions, etc. Each team should observe how mathematics is used in each service.

IV. The teams should share their reports with the class at a designated time.

INSTRUCTIONAL MATERIALS

1-0-0 Orientation

1-1-0 Filmstrips - "A New Look at Home Economics Careers" and "Why Work at All"

1-1-4 Questionnaire

1-2-0 Guide for studying a particular house care service

INSTRUCTIONS FOR COMPLETING UNIT REVIEW SHEET

A. Heading Information:

1. Course: Enter the name of Interest-Based Curriculum Area, for example, Science for Homemakers.

2. Teacher: Enter name of the teacher managing the instructional activities.

3. Unit Title: Enter title of the unit, for example, Common Fractions .

4. Beginning Date: Enter date unit was begun.

5. End Date: Enter date unit was completed.

I. Time Spent on Unit

Objectives: Enter the number(s) of the process-task level objectives covered, not the interim-performance objectives.

Estimated Time: Enter the estimated time for completion of each process/task objective in terms of class periods. This should be done before the unit is begun.

Actual Time: Enter the number of class periods actually used to complete the objective.

Date Completed: Enter date of the last class period spent on the task objective.

II. Objectives Covered

A. If all objectives in the unit were covered, check "yes"; if not, check "no."

B. If all objectives were not covered, list objectives by number and indicate reasons why they were not covered.

III. Appropriateness of Objectives

A. Consider the objectives, the activities, the instructional materials, and the evaluative materials. If all were appropriate for your students, check "yes." If either the objectives, the activities, materials, or evaluation were not appropriate, check "no."

B. List the number(s) of the objectives which were not appropriate--or for which materials, activities, or evaluation materials were not appropriate--and give reasons.

IV. Write any suggestions you think would improve any part of the unit.

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT II
Whole Numbers

2-0-0 Upon completion of this unit the house care students will demonstrate a basic knowledge of the operation of whole numbers by scoring 70% or above on a teacher-made test.

2-1-0 The project teacher will use filmstrips, ruler, tape measure, and SRA Mathematics Kit to teach addition of whole numbers.

2-1-1 Given a pretest on the fundamental operations of whole numbers, those students scoring above 70% will proceed to 3-0-0 and all other students will continue this unit.

2-1-2 Lecture on addition of whole numbers with the use of a filmstrip, tape measure, and ruler

2-1-3 Activity: Addition of Whole Numbers

2-1-4 SRA Mathematics Kit

2-1-5 Activity: Verbal Problems Related to Services Using Addition

2-2-0 The project teacher will use a filmstrip and lecture to teach subtraction of whole numbers.

2-2-1 Lecture on subtraction of whole numbers

2-2-2 Activity: Subtraction of Whole Numbers

2-2-3 SRA Mathematics Kit

2-3-0 The project teacher will use chalkboard, filmstrip, lecture, and SRA Mathematics Kit to teach multiplication of whole numbers.

2-3-1 Lecture on multiplication of whole numbers

2-3-2 Activity: Multiplication of Whole Numbers

2-3-3 SRA Mathematics Kit for those having trouble

2-4-0 The project teacher will use overhead projector, lecture, SRA Mathematics Kit and filmstrip to teach division of whole numbers.

2-4-1 Lecture using overhead projector

2-4-2 Activity: Division of Whole Numbers

2-4-3 SRA Mathematics Kit for students still having trouble

2-5-0 The project teacher will use lecture and chalkboard to teach rounding whole numbers.

2-5-1 Lecture

2-5-2 Activity: Rounding Whole Numbers

2-6-0 The project teacher will use lecture, chalkboard, and overhead projector to teach order of operations.

2-6-1 Lecture

2-6-2 Study Sheet: Order of Operations

2-6-3 Activity: Order of Operations

2-7-0 The project teacher will administer a unit test

2-7-1 Unit Test

2-1-1 Pretest: Whole Numbers

ADDITION

Do not copy. Write the answers on a paper folded under the exercises.

Time Limit - Five Minutes

1.	2.	3.	4.	5.	6.
934	991	599	856	653	909
502	70	921	390	317	591
695	506	128	500	846	264
855	30	691	38	94	328
428	900	23	30	393	462
672	810	109	206	54	331
749	40	175	603	7	925
351	482	126	15	956	
	765				

SUBTRACTION

Do not copy. Write the answers on a paper folded under the exercises.

Time Limit - Four Minutes

1.	2.	3.	4.	5.
6803	5051	20000	2300	90405
2259	1051	7175	1101	2850

6.	7.	8.	9.	10.
50105	106000	91075	85317	20073
13937	87005	6718	34578	19000

MULTIPLICATION

Time Limit - Four Minutes

1.	2.	3.	4.	5.	6.
352	6060	40060	18043	30308	97000
45	520	319	175	405	200

DIVISION

Time Limit - Six Minutes

1. $7575 \div 50$
2. $9844 \div 24$
3. $5551 \div 56$
4. $1116 \div 27$
5. $5360 \div 64$

2-1-3 Activity: Addition of Whole Numbers

Add the following:

1. $\begin{array}{r} 25 \\ 32 \\ \hline \end{array}$

2. $\begin{array}{r} 236 \\ 356 \\ \hline \end{array}$

3. $\begin{array}{r} 981 \\ 259 \\ \hline \end{array}$

4. $\begin{array}{r} 6523 \\ 3528 \\ \hline \end{array}$

5. $\begin{array}{r} 2965 \\ 2431 \\ 5675 \\ 2291 \\ \hline \end{array}$

6. $\begin{array}{r} 962 \\ 829 \\ 13 \\ \hline \end{array}$

7. $\begin{array}{r} 552 \\ 23 \\ 1 \\ 10 \\ \hline \end{array}$

8. $\begin{array}{r} 200,623 \\ 352 \\ 91 \\ 7 \\ 8,234 \\ \hline \end{array}$

9. $\begin{array}{r} 792,648 \\ 2,362 \\ 9,186 \\ 1,524 \\ \hline \end{array}$

10. $\begin{array}{r} 315,223 \\ 7,109 \\ 4,324 \\ 2,222 \\ \hline \end{array}$

11. 15 + 28

12. 64 + 782 + 12 + 8

13. 298 + 361 + 492 + 85

14. 1,006 + 3,266 + 1,924,671

15. 85 + 2,000 + 965 + 7

16. 962 + 829 + 13 + 1,009

17. $\begin{array}{r} 456 \\ 234 \\ 956 \\ 321 \\ \hline \end{array}$

18. $\begin{array}{r} 145 \\ 264 \\ 981 \\ 229 \\ \hline \end{array}$

19. $\begin{array}{r} 58,357.64 \\ 964.20 \\ 7,483.50 \\ 9,172.78 \\ \hline \end{array}$

20. $\begin{array}{r} 3,286.95 \\ 82,164.56 \\ 87.34 \\ 412.59 \\ 824.15 \\ \hline \end{array}$

2-1-5 Activity: Verbal Problems Related to House Care Services Using Addition

1. Twelve clerks employed in a local department store receive the following weekly salaries: $22.75, $24.45, $18., $24., $22.50, $16., $15., $21.50, $27.50, $17.50, and $18.50.

   (a) Find the total weekly payroll of the department store.

   (b) Find the average of the weekly salaries.

   (c) Find the total annual payroll.

   (d) Find the average of the annual salaries.

   (These salaries do not include commissions on sales usually paid to salesclerks.)

2. During the summer, John received $39.65 for delivering groceries, $12.75 for mowing lawns, $35.50 for delivering newspapers, and $28.50 for cleaning offices. How much did John earn during the summer?

3. The lot on which a house stands is 55 ft. wide and from front to back is 160 ft. long. How many feet of fencing will it take for a fence along the two sides and across the back of the lot?

4. Mary and Paul cleaned the following numbers of motel rooms during the week: Mon. - 39; Tue. - 20; Wed. - 10; Thur. - 41; Fri. - 37; and Sat. - 49. What was the total number of rooms cleaned during the week?

5. Mary used 10 yards of material to upholster a sofa, 8 yards for a chair, and 29 yards to make curtains. How many yards of material did she need?

2-2-2 Activity: Subtraction of Whole Numbers

In each example, subtract and check.

1.	49 32	2.	55 29	3.	197 35	4.	275 178	5.	833 756	6.	573 389
7.	624 605	8.	982 659	9.	856 674	10.	402 28	11.	15,949 3,476		
12.	42,237 38,067	13.	84,457 67,368	14.	450,278 320,765	15.	234,560 87,459	16.	648,902 97,859		
17.	$102.25 85.48	18.	$327.46 285.64	19.	$2,325.87 1,275.59	20.	$1,250.00 864.72				

21. Mrs. Smith needs to have her sofa and chair upholstered. She finds that the total cost of the job is $249.50. If the material costs $158.65, how much will labor cost?

2-3-2 Activity: Multiplication of Whole Numbers

Multiply:

1. $\begin{array}{r} 83 \\ \times\ 27 \\ \hline \end{array}$ 2. $\begin{array}{r} 109 \\ \times\ 64 \\ \hline \end{array}$ 3. $\begin{array}{r} 246 \\ \times\ 58 \\ \hline \end{array}$ 4. $\begin{array}{r} 249 \\ \times\ 104 \\ \hline \end{array}$ 5. $\begin{array}{r} 668 \\ \times\ 187 \\ \hline \end{array}$ 6. $\begin{array}{r} 594 \\ \times\ 256 \\ \hline \end{array}$

7. $\begin{array}{r} 825 \\ \times\ 362 \\ \hline \end{array}$ 8. $\begin{array}{r} 784 \\ \times\ 495 \\ \hline \end{array}$ 9. $\begin{array}{r} 6,738 \\ \times\ 7,654 \\ \hline \end{array}$ 10. $\begin{array}{r} 6,159 \\ \times\ 4,000 \\ \hline \end{array}$ 11. $\begin{array}{r} 6,080 \\ \times\ 306 \\ \hline \end{array}$ 12. $\begin{array}{r} 2.586 \\ \times\ 144 \\ \hline \end{array}$

13. $\begin{array}{r} 3,050 \\ \times\ 3,050 \\ \hline \end{array}$ 14. $\begin{array}{r} 89,612 \\ \times\ 27,064 \\ \hline \end{array}$ 15. $\begin{array}{r} 90,406 \\ \times\ 5,634 \\ \hline \end{array}$ 16. $\begin{array}{r} 92,745 \\ \times\ 2,468 \\ \hline \end{array}$ 17. $\begin{array}{r} 24,357 \\ \times\ 1,689 \\ \hline \end{array}$

18. $\begin{array}{r} 82,460 \\ \times\ 5,793 \\ \hline \end{array}$

19. 4,258 x 8,000

20. 6,344 x 6,000

21. Jane is buying 6 yards of cloth at $1.95 a yard. What is the cost of 6 yards of cloth?

Find the cost of each of the following purchases:

22. 45 square yards of linoleum at $2.07 a square yard

23. 85 yards of carpet at $5.85 a yard

24. 28 yards of curtain material at $1.50 a yard

25. 30 yards of unglazed chintz at $1.39 a yard

2-4-2 Activity: Division of Whole Numbers

Divide and check:

1. $18 \div 9$ 2. $40 \div 8$ 3. $2 \div 2$ 4. $56 \div 7$ 5. $72 \div 9$

6. $33{,}962 \div 4$ 7. $81{,}675 \div 9$ 8. $522{,}291 \div 969$ 9. $60{,}200 \div 344$

10. $565{,}125 \div 672$ 11. $64{,}960 \div 2{,}240$ 12. $303{,}009 \div 307$

13. $531{,}056 \div 792$ 14. $154{,}728 \div 4{,}298$ 15. $339{,}327 \div 1{,}019$

16. $\$247.95 \div 87$ 17. $\$472.36 \div 98$ 18. $\$394.98 \div 87$

19. $\$107.92 \div 76$ 20. $4278 \div 93$

21. Thirty-two yards of curtain material costs $15.04. What did the material cost per yard?

22. Mrs. Jones spent $783.60 for food last year. What was her expenditure per month for food?

23. Martha received $1008. for 16 weeks of work in a beauty parlor. What was her average weekly income?

24. The total pay received by Ben for work he did in 10 days was $225. What were his average earnings per day?

25. If 26 yards of curtain material costs $45.50, how much did one yard of the material cost?

2-5-2 Activity: Rounding Whole Numbers

Example: 5,891,726 rounded to the nearest ten is : 5,891,730
hundred is : 5,891,700
thousand is: 5,892,000
million is : 6,000,000

I. Round each of the following numbers to the nearest:

1. Ten: (a) 49 (b) 75 (c) 26 (d) 484 (e) 7,966

2. Hundred: (a) 321 (b) 693 (c) 5,279 (d) 1,507 (e) 29,813

3. Thousand: (a) 6,950 (b) 8,441 (c) 16,538 (d) 49,552 (e) 84,721

4. Ten thousand: (a) 46,000 (b) 93,829 (c) 16,538 (d) 49,552
(e) 73,987

5. Hundred thousand: (a) 820,000 (b) 362,495 (c) 554,019
(d) 4,180,551 (e) 39,349,653

6. Million: (a) 5,700,000 (b) 6,748,000 (c) 16,435,625
(d) 816,502,054 (e) 7,434,198,572

7. Billion: (a) 5,723,000,000 (b) 2,050,900,000 (c) 7,486,460,000
(d) 49,865,502 760 (e) 521,254,000,000

II. Any number from:

1. 65 to 74 rounded to the nearest ten is what number?

2. 8,500,000,000 to 9,499,999,999 rounded to the nearest billion is what number?

3. 550 to 649 rounded to the nearest hundred is what number?

2-6-2 Study Sheet: Order of Operations

A pair of parentheses is called a symbol of inclusion. Other symbols used are brackets, braces, and a bar.

Parentheses and the other symbols of inclusion are customary means used to make clear the meaning of a numerical expression. If the punctuation marks are omitted, use the following rules:

1. Perform the multiplications and divisions in order from left to right.

2. Finally, do the additions and subtractions in order from left to right.

EXAMPLES

1. $4 + 6 \times 2$ means $4 + (6 \times 2) = 4 + 12 = 16$

2. $5 \times 4 + 2$ means $(5 \times 4) + 3 = 20 + 3 = 23$

3. $32 \div 4 - 2$ means $(32 \div 4) - 2 = 8 - 2 = 6$

4. $7 \times 6 - 7 \times 2$ means $(7 \times 6) - (7 \times 2) = 42 - 14 = 28$

5. $4 \times 2 \times 3$ means $(4 \times 2) \times 3 = 8 \times 3 = 24$

6. $5 + 4 + 3$ means $(5 + 4) + 3 = 9 + 3 = 12$

7. $9 - 3 - 2$ means $(9 - 3) - 2 = 6 - 2 = 4$

8. $6 + 2(8 - 2)$ means $6 + 2(6) = 6 + 12 = 18$

2-5-3 Activity: Order of Operations

Perform the indicated operations:

1. $4 \times 3 + 2$
2. $6 \div (3 - 1)$
3. $67 + 8 \div 2$
4. $5 + 6 \div 2$
5. $10 \div 5 + 5$
6. $79 \times 84 - 3$
7. $2 + 2 \times 2$
8. $9 + 81 \div 3$
9. $10 \div 5 \times 4$
10. $10 + 9 + 2$
11. $80 \div 8 - 80 \div 10$
12. $18 - 6(3) + 5$
13. $39 \times 9 + 39 \times 1$
14. $6 \times 2 - 2 \div 2$
15. $14 \div 1 \times 7$
16. $49 + 5 \times 10$

2-7-1 UNIT TEST: WHOLE NUMBERS

I. Completion

Complete the following statements to make them true.

1. The answer in addition is the _____.

2. The number from which we subtract is the _____.

3. The number we subtract is the _____.

4. The answer in subtraction is the _____ or the difference.

5. To prove subtraction, add the _____ and the _____; their sum should equal the _____.

6. The number that we multiply is the _____.

7. The number by which we multiply is the _____.

8. The answer in multiplication is the _____.

9. The number that we divide is the _____.

10. The number by which we divide is the _____.

11. The number left over after dividing is the _____.

12. To prove division, multiply the _____ by the divisor and add the _____ to the product. The answer should equal the _____.

II. Add the following:

1. 25 + 67

2. 224 + 73

3. 43214 + 4325

4. 41321 + 612314

5. 16 + 47 + 39

6. 217 + 316 + 149

7. 2317 + 2262 + 3473 + 1051

8. 260319 + 219327 + 456214

9. 212306 + 321452 + 214673 + 673251 + 316923

10. 31156 + 14214 + 82 + 673 + 3214

III. Subtract the following:

1.	2.	3.	4.	5.
37 6	327 16	4565 215	17625 3214	97 78

6.	7.	8.	9.	10.
5028 4917	74003 21456	67524 29689	900435 417524	675247 321125

IV. Multiply the following:

1.	2.	3.	4.	5.
92 4	42 9	679 7	7598 8	341 200

6.	7.	8.	9.	10.
403 214	1421 325	7489 869	700 466	9251 809

V. Divide the following:

1. $81 \div 9$
2. $900 \div 10$
3. $687 \div 9$
4. $975 \div 123$
5. $7295 \div 521$
6. $97542 \div 379$
7. $37524 \div 6$
8. $2354 \div 421$
9. $66831 \div 312$
10. $696 \div 58$

VI. Round each of the following numbers first to the nearest million, then to the nearest hundred thousand, then to the nearest ten thousand, and finally to the nearest thousand.

1. 32,666,059
2. 1,813,286
3. 3,174,660
4. 15,019,833
5. 8,409,691

VII. Solve each of the following problems:

1. If Mr. Slater drives 350 miles each day, how many miles will he drive in 5 days?

2. There are 250 custodians employed at Northwestern State University. If each employee works 40 hours a week, what is the total number of hours worked by all of the employees in one week?

3. If 68 quarts of cleaning fluid are removed from a stock of 255 quarts, how many quarts are left in the stock?

4. An upholstering shop buys 96 yards of material. How many sofas can be upholstered if each sofa requires 12 yards of material?

VIII. Simplify each of the following expressions:

1. $12 - 0 + 1$

2. $17 \times 25 \times 4$

3. $64 \div 8 \div 4 \div 2$

4. $3 + 48 - 16 - 35 \div 7$

5. $5 + 4 - 3 + 1$

6. $\dfrac{2 \times 3 + 21}{2 + 1}$

7. $32 \div 8 + 3$

8. $\dfrac{15 \div 3 + 2 \times 3}{2(5 + 6)}$

9. $16 + 8 \div 2$

10. $2 \times 3 + 4$

INSTRUCTIONAL MATERIALS

2-0-0 Unit II: Whole Numbers

2-1-0 Addition of Whole Numbers

2-1-1 Pretest

2-1-2 Tape measure, ruler

2-1-3 Activity sheet

2-1-4 SRA Mathematics Kit

2-1-5 Activity sheet

2-2-0 Subtraction of Whole Numbers

2-2-2 Activity sheet

2-2-3 SRA Mathematics Kit

2-3-0 Multiplication of Whole Numbers

2-3-2 Activity sheet

2-3-3 SRA Mathematics Kit

2-4-0 Division of Whole Numbers

2-4-1 Overhead projector

2-4-2 Activity sheet

2-4-3 SRA Mathematics Kit

2-5-0 Rounding Whole Numbers

2-5-2 Activity sheet

2-6-0 Order of Operations

2-6-2 Study sheet

2-6-3 Activity sheet

2-7-0 Evaluation

2-7-1 Evaluative material

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course _____ Teacher _____

Unit Title _____ Date _____

Beginning Date _____ End Date _____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT III
Common Fractions

3-0-0 Upon completion of this unit, the housecare students will demonstrate a basic understanding of fractions by scoring 70% or above on a teacher-made test.

3-1-0 The project teacher will administer a pretest to determine the previous skills of the students.

3-2-0 The project teacher will assign supplementary activities to students scoring 70% or above on the pretest. Students scoring below 70% will complete the entire unit.

3-3-0 The project teacher will use a tape measure, a folding rule, Merrill skilltapes and filmstrips to teach the meaning of fractions.

3-3-1 Use rule and tape measure to show fractional parts.

3-3-2 Students will measure floors, windows, and other items in the room to the nearest 1/16 inch.

3-3-3 Study Sheet: Understanding Fractions

3-3-4 Activity: Understanding Fractions

3-3-5 Students needing extra help use Merrill skilltapes, Understanding Fractions, A through D.

3-4-0 The project teacher will use a tape measure and carpenters rule to teach reducing or raising fractions to equivalent fractions.

3-4-1 Lecture and filmstrip - "Equivalent Fractions"

3-4-2 Activity: Equivalent Fractions

3-4-3 Have students write five equivalent fractions for 1/2, 1/4, 1/8, and 1/16.

3-5-0 The project teacher will use various housekeeping tools to teach arranging fractions in order from least to greatest.

3-5-1 Arrange a set of measuring cups in order from least to greatest.

3-5-2 Activity: Arranging Fractions in Order

3-6-0 The project teacher will use cassette tapes and prepared work sheets to teach common denominators and mixed numbers.

3-6-1 Listen to cassette tape and complete work sheet.

3-6-2 Cyclo-Teacher, M-73

3-7-0 The project teacher will use a tape measure, Merrill skilltapes, and lecture to teach addition of fractions.

3-7-1 Use tape measure and models to add fractions.

3-7-2 Merrill skilltape - Addition of Fractions, A and B

3-7-3 Activity: Addition of Fractions

3-8-0 The project teacher will use tape measure, rule, Merrill skilltapes, and other visual aids, and lecture to teach subtraction of fractions.

3-8-1 Use rule, tape measure, and measuring cups to subtract fractions.

3-8-2 Lecture using overhead projector

3-8-3 Filmstrip - "Subtracting Fractions"

3-8-4 Merrill skilltape - Subtraction of Fractions

3-8-5 Activity: Subtraction of Fractions

3-8-6 Cyclo-Teacher, M-73, for students still having trouble

3-9-0 The project teacher will use filmstrips, skilltapes, overhead projector, and lecture to teach multiplication of fractions.

3-9-1 Filmstrip - "Multiplication of Fractions"

3-9-2 Merrill skilltape - Multiplication of Fractions

3-9-3 Activity: Multiplying Fractions

3-10-0 The project teacher will use filmstrip, Merrill skilltapes, overhead projector and lecture to teach division of fractions.

3-10-1 Filmstrip

3-10-2 Lecture using overhead projector

3-10-3 Merrill skilltape - Division of Fractions

3-10-4 Activity: Dividing Fractions

3-11-0 The project teacher will use lecture, overhead projector, and chalkboard to develop skills in practical application of problems involving fractions.

3-11-1 The project teacher will discuss and solve problems involving practical application of fractions.

3-11-2 Activity: Problems Involving Fractions

3-12-0 The project teacher will administer a unit test on fractions.

3-12-1 Unit Test

3-2-0 Pretest: Common Fractions

I. Perform the operations indicated.

(a) Reduce to whole or mixed numbers:

1. 48/2 = _____
2. 245/12 = _____
3. 92/7 = _____
4. 312/15 = _____
5. 127/8 = _____
6. 295/19 = _____

(b) Reduce to improper fractions:

1. 18 1/2 = _____
2. 78 7/9 = _____
3. 107 3/5 = _____
4. 31 3/5 = _____
5. 29 5/6 = _____
6. 324 1/7 = _____

(c) Change to simple fractions or whole numbers:

1. 1/3 of 1/3 = _____
2. 1/2 of 1/3 = _____
3. 3/4 of 2/5 = _____
4. 2/3 of 7/8 = _____
5. 1/2 / 1/4 = _____
6. 3/4 / 1/6 = _____
7. 1/5 / 7/8 = _____
8. 3/4 / 2 2/3 = _____
9. 6 4/5 / 8 1/3 = _____
10. 8 3/4 / 7/8 = _____

(d) Change to higher terms:

1. 5/6 to 48'ths = _____
2. 1/2 to 16'ths = _____
3. 2/9 to 81'rsts = _____
4. 7/8 to 120'ths = _____
5. 2/3 to 84'ths = _____
6. 5/8 to 120'ths = _____

II. Perform the operations indicated.

(a) Add:

1. 3/4 + 1/2 = _____
2. 5/6 + 2/3 = _____
3. 3/7 + 5/7 + 4/7 = _____
4. 4 1/2 + 3 3/4 + 24 3/8 = _____

5. 7/15 + 2/3 + 4/5 = _____

6. 5/8 + 3/4 + 1/16 = _____

7. 2/9 + 4/9 + 8/9 + 7/9 = _____

8. 2/3 + 5/9 + 5/6 = _____

9. 5/6 + 7/8 = _____

10. 5/8 + 3/8 = _____

(b) Subtract:

1. 5/8 - 3/8 = _____

2. 5/6 - 1/3 = _____

3. 5/12 - 1/8 = _____

4. 3/4 - 5/8 = _____

5. 1/4 - 1/8 = _____

6. 6 1/4 - 3 1/8 = _____

7. 23 5/6 - 17 1/4 = _____

8. 16 1/2 - 14 1/4 = _____

9. 78 - 16 2/3 = _____

10. 508 3/14 - 299 8/21 = _____

(c) Multiply:

1. 48 x 2/3 = _____

2. 5/8 x 64 = _____

3. 3/16 x 44 = _____

4. 1/2 x 1/4 = _____

5. 12 4/9 x 5 1/4 = _____

6. 18 2/3 x 3/4 = _____

7. 36 x 2 1/2 = _____

8. 3 3/5 x 5 5/6 = _____

9. 12 3/4 x 16 2/3 = _____

10. 16 1/2 x 2 2/11 = _____

(d) Divide:

1. 8/9 ÷ 4 = _____

2. 15 ÷ 3/4 = _____

3. 3/5 ÷ 5/6 = _____

4. 9/11 ÷ 5/6 = _____

5. 22/7 ÷ 2/3 = _____

6. 15 3/4 ÷ 9 = _____

7. 8 1/3 ÷ 6 1/4 = _____

8. 17 5/6 ÷ 13 6/7 = _____

9. 24 3/5 ÷ 10 1/8 = _____

10. 46 3/8 ÷ 7/9 = _____

3-3-3 Study Sheet: Fractions

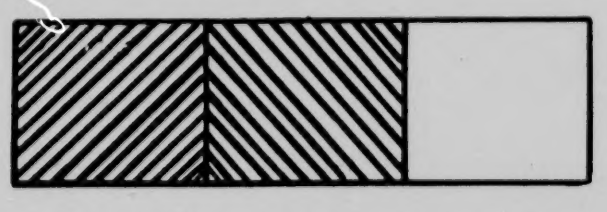
Simple fractions occur frequently in housekeeping and no one is competent to do figuring required in everyday house services unless he understands fractions.

FRACTION: A number in the form 1/2, 2/3, or 6/5 is called a fraction or a fractional numeral. It is also called a common fraction.

NUMERATOR AND DENOMINATOR: A fraction is always written by means of two numbers (usually integers). The number represented above the line is called the numerator of the fraction. The number represented below the line is called the denominator of the fraction. The denominator may be any number except zero. Therefore, every fraction is of the form: $\frac{\text{NUMERATOR}}{\text{DENOMINATOR}}$.

The denominator states into how many equal parts a unit has been divided; and the numerator states how many parts are represented by the fraction.

Thus, in the fraction 2/3, the denominator, 3, states that a unit has been divided into 3 equal parts and the numerator, 2, states that two of these three parts are represented by the fraction.



The shaded portion represents 2/3.

We may also use fractions as symbols or names for whole numbers. Examples: 2/1, 4/2, 1/1, 9/3

PROPER FRACTION: A fraction whose numerator is less than its denominator is called a proper fraction. Examples: 1/2, 3/4, 5/6, 7/8, 4/9

IMPROPER FRACTION: A fraction whose numerator is greater than or equal to its denominator is called an improper fraction. Examples: 3/3, 6/6, 3/2, 4/3, 9/8

MIXED NUMBER: A number consisting of a whole number and a fraction is called a mixed number. Examples: 1 1/2, 3 2/3, 3 3/4, 6 1/8

FRACTION IN LOWEST TERMS: When the numerator and denominator of a fraction have no common factor except 1, the fraction is said to be in lowest terms.

REDUCTION OF FRACTION TO LOWEST TERMS: A fraction not in its lowest terms may be reduced by dividing both the numerator and the denominator by their greatest common factor.

Example: $\frac{6 \div 2}{8 \div 2} = \frac{3}{4}$, $\frac{4 \div 4}{8 \div 4} = \frac{1}{2}$

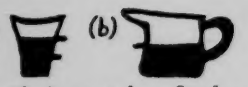
3-3-4 Activity: Understanding Fractions

1. Classify each of the following fractions as proper or improper:

   (a) 3/5 (b) 1/2 (c) 9/2 (d) 4/4 (e) 1/1

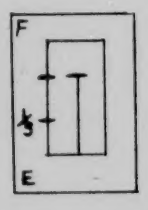
2. (a) What fractional part of the cake is left?

   (b) What fractional part of each container is empty? How full is each?

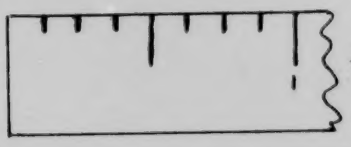


3. Write the numeral naming the fraction indicated in each of the following devices or gauges.

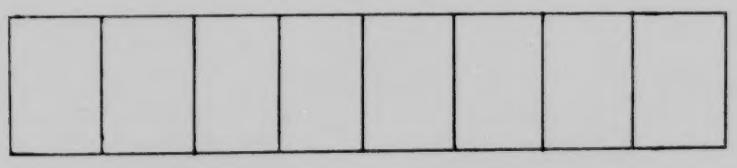
   (a)



   (b)



4. Shade 1/2 of the following figure:



Use a tape measure to measure each of the following segments to the nearest 16'th of an inch.

5. _____

6. _____

7. _____

8. _____

Reduce the following fractions to their lowest terms:

9.	6/12	13.	3/15
10.	124/248	14.	9/27
11.	9/81	15.	3/6
12.	111/259	16.	116/344

Change the following to improper fractions:

17. 28 2/3

18. 31 1/6

19. 46 1/2

20. 58 7/8

3-7-3 Activity: Addition of Fractions

Add the following and reduce to lowest terms:

1. $\frac{2}{8} + \frac{1}{8}$ 2. $\frac{7}{16} + \frac{1}{16}$ 3. $\frac{2}{5} + \frac{3}{5}$ 4. $\frac{7}{8} + \frac{1}{8}$ 5. $\frac{1}{24} + \frac{3}{8}$ 6. $\frac{1}{2} + \frac{2}{3}$

7. $\frac{5}{7} + \frac{1}{14}$ 8. $\frac{2}{9} + \frac{1}{3}$ 9. $\frac{1}{5} + \frac{1}{6}$ 10. $\frac{3}{4} + \frac{1}{12}$ 11. $\frac{9}{10} + \frac{1}{30}$ 12. $\frac{1}{3} + \frac{2}{15}$

13. $2\frac{1}{5} + 3\frac{4}{5}$ 14. $8\frac{7}{9} + 2\frac{1}{3}$ 15. $1 + \frac{3}{4}$ 16. $2\frac{3}{4} + \frac{2}{16}$ 17. $21\frac{3}{8} + 22\frac{5}{7} + 1\frac{1}{2}$

18. $2\frac{1}{4} + 5\frac{5}{8} + 6\frac{11}{16}$ 19. $1\frac{1}{2} + 25\frac{3}{5} + 36\frac{1}{4} + 9\frac{1}{20} + 22\frac{1}{10}$ 20. $7\frac{5}{8} + 28\frac{3}{4} + 29\frac{5}{16} + 15\frac{4}{32}$

21. What is the perimeter of a rectangular yard 56 3/4 feet wide and 96 3/8 feet long?

22. A housewife needed to purchase 6 1/4 yards of material for a bedspread and 15 3/8 yards of matching material for curtains. How much material did she need to purchase?

23. Mary worked part-time after school. She worked 2 1/2 hours on Monday, 1 3/4 hours on Tuesday, 1 1/3 hours on Wednesday, 2 1/6 hours on Thursday, a. 1/2 hour on Friday. How many hours did she work during the week?

Mrs. Gair usually waits for the summer sales to buy her sewing material for the year. She checks and finds out that she needs the following. Find the totals:

24. Curtain material: 4 1/3 yds, 2 1/3 yds, and 6 5/6 yds

25. Wool for suit: 3 2/9 yds, 3/4 yd, 6 5/12 yds

26. Red velvet for a dress: 2 3/8 yds, 1 7/32 yds

27. Lester cleans carpet at Natchitoches Central High School. He discovers that it takes 3 1/2 gallons of fluid to clean one section, 8 2/3 gallons to clean another section. How much fluid does he need to clean the two sections?

Mary has a job cleaning offices. She kept a record of the time spent on each of three jobs. Find the number of hours worked on each job and the total number of hours worked.

28. LaCaze Real Estate: 1/2 hr, 1 1/4 hrs, 1 hr & 20 min, 3/4 hr, 30 min

29. Medical Building: 1 1/3 hrs, 1 2/3 hrs, 2/3 hr, 1 3/4 hr, 1 1/2 hrs

30. Natchitoches Court House: 1 3/4 hrs, 1 1/2 hrs, 3 1/4 hrs, 2/3 hr, 1 1/3 hrs

31. Total hours worked:

32. How much material will Mrs. Reed need to buy for each window if the curtains are to have the following measurements: Finished length, 62 1/2 in., allowance for hem at top, 4 3/4 in., allowance for hem at bottom, 2 3/8 in.

3-8-5 Activity: Subtraction of Fractions

Perform the subtraction in each of the following. Reduce all answers to the lowest term:

1. 4/5 - 2/5 2. 11/12 - 1/12 3. 1 7/8 - 3/8 4. 15/16 - 14/16

5. 7/8 - 2/8 6. 7/8 - 3/8 7. 3/4 - 2/4 8. 4/9 - 1/9

9. $\begin{array}{r} 6\ 3/8 \\ \underline{1\ 3/4} \end{array}$ 10. $\begin{array}{r} 8\ 2/5 \\ \underline{5\ 3/4} \end{array}$ 11. $\begin{array}{r} 11\ 4/8 \\ \underline{4\ 11/16} \end{array}$ 12. $\begin{array}{r} 8\ 1/6 \\ \underline{3\ 2/3} \end{array}$ 13. $\begin{array}{r} 15\ 5/7 \\ \underline{7\ 1/5} \end{array}$

14. $\begin{array}{r} 52\ 4/9 \\ \underline{17\ 3/7} \end{array}$ 15. $\begin{array}{r} 64\ 5/16 \\ \underline{13\ 5/8} \end{array}$ 16. $\begin{array}{r} 13/16 \\ \underline{5/8} \end{array}$ 17. $\begin{array}{r} 7/8 \\ \underline{1/9} \end{array}$ 18. $\begin{array}{r} 15 \\ \underline{10\ 1/5} \end{array}$

19. From a 40 gallon can, a janitor used at different times 3 3/8 gal., 4 1/4 gal., and 5 1/8 gal. After each cleaning what number did he write on the can or his chart showing the remaining gallons? At the end of the week, his chart showed the number of remaining gallons as 27 3/4 gallons. Was this correct?

Mr Richardson owns a floor cleaning service. He buys his supplies in 50 gallon cans. Below is a portion of his inventory. How many gallons were left in each can?

	ITEM	GALLONS USED	GALLONS LEFT
20.	Shampoo	47 3/4	
21.	Liquid Wax	20 1/2	
22.	Spot Remover	8 1/6	

AA

3-9-3 Activity: Multiplication of Fractions

In multiplying fractions, multiply the numerators together to get the numerator of the product and multipiy the denominators together to get the denominator of the product.

Find the product:

1. 1/12 x 5/8 2. 15/16 x 4/5 3. 1/3 x 5/8 4. 1/4 x 2 5/8

5. 4 3/8 x 1/5 6. 8 1/3 x 2 7/10 7. 5 5/12 x 2 5/8

8. 4 1/8 x 1 1/3 9. 10 1/2 x 1 2/5 10. 4 x 5 11/12

11. $\begin{array}{r} 12 \\ \underline{7\ 2/3} \end{array}$ 12. $\begin{array}{r} 15 \\ \underline{10\ 3/8} \end{array}$ 13. $\begin{array}{r} 31{,}416 \\ \underline{8\ 1/5} \end{array}$ 14. $\begin{array}{r} 406 \\ \underline{3\ 1/7} \end{array}$ 15. $\begin{array}{r} 800\ 2/5 \\ \underline{69} \end{array}$

16. 2/3 x 1/2 x 3/4 17. 3/8 x 20/5 x 35 18. 1 1/2 x 5/6 x 1/100

19. Peggy is a housewife and plans to serve "chicken with rice" at a club meeting. How much did Peggy need of each ingredient in the following recipe in order to serve 18 persons?

Chicken with Rice
(serves 6)

- 2 onions
- 1 cup celery
- 1/2 cup mushrooms
- 1/2 green pepper
- 3/4 lb. chicken
- 1/2 cup soup stock
- 1 1/2 teaspoons salt
- 1/2 cup rice

Make out invoice forms, figure the extensions, and find the total cost.

20.

Cleaning Agents		
86 qt. Spot Remover	@	$1.07 1/2
58 qt. Wax Remover	@	.61 3/8
154 qt. Wax	@	1.89 7/8
91 qt. liquid soap	@	.81 3/4

3-10-4 Activity: Division of Fractions

To divide a fraction by a fraction, invert the divisor and multiply.

Find the quotient:

1. $1/4 \div 3/5$ 2. $2/5 \div 2/3$ 3. $1/3 \div 1/2$ 4. $1/5 \div 5/6$

5. $4\ 1/5 \div 7/10$ 6. $7 \div 3\ 3/20$ 7. $3/5 \div 5\ 2/5$ 8. $4\ 1/5 \div 2\ 1/10$

9. $1\ 7/8 \div 4\ 1/6$

10. (a) Into how many 1/2 yd. lengths can a piece 10 yds. long be divided?
    (b) How many pieces , each 3/4 of a yard, can be cut from a bolt 41 1/2 ydss long?

Find the hourly rate of pay for each of the workers whose weekly records are shown below?

	Employee	Total Hours	Total Wages	Hourly Rate
11.	Sue	39 3/4	$38.96	
12.	Tina	39 5/6	38.24	
13.	Lynn	38 1/2	38.12	
14.	Beverly	38 5/6	47.77	
15.	Melezine	39 3/4	38.96	

16. If cotton print is selling for 37 1/2¢ per yard (.37 1/2¢ = $3/8), how many yards can be bought for $120.?

3-11-2 Activity: Problems Involving Fractions

1. If a domestic maid earns $3 1/2 a day, how much will she earn in 20 days?

2. A housewife purchases 4 1/4 lbs. of coffee at 20 1/2¢ per pound, and 2 1/2 lbs. of sugar at 8¢ per pound. How much change will she receive from a $5. bill?

3. In a day's driving to work, an automobile consumed 20 5/8 gallons of gasoline at 21 1/2¢ per gallon. What was the cost of the trip per day?

4. A shopper purchases 8 1/2 yards of dress material at 60¢ per yard, 4 1/2 yards of ribbon at 33 1/3¢ per yard, and 34 buttons at 15¢ per dozen. What was the total amount of the purchase?

5. Three partners were to share profits or losses as follows:
   A - 3 shares B - 4 shares C - 5 shares
   The total profit amounted to $6,000. How much did each receive?

6. Mary is an assistant seamstress. The opening down the front of a blouse is 6 in. This must have a binding around it, for which Mary must allow 2 1/2 times the length of the opening, plus 1 1/4 in. How much binding does she need?

7. A florist's salesgirl made the following sales of roses: 1 3/4 doz., 2 2/3 doz., 1 5/6 doz., and 3 1/2 doz. If she had 10 dozen to sell, how many dozen remain to be sold?

8. Mrs. Turner needs 2 3/4 cups of washing powder for each of eight loads of sheets. How many cups of washing powder does she need for the washing?

9. For trim on a dress, a seamstress needs three pieces of braid with lengths 2 1/4 yds., 3 2/3 yds., and 4 3/4 yds. How many yards of the braid does she need?

10. If it takes 1 7/8 yards of goods to make a chair cover, how many yards of goods are needed to make 6 covers?

11. How many degrees above normal is a temperature of 101 2/5 degrees if normal temperature is 98 3/5 degrees?

12. Gail works after school and on Saturdays as a nurse's aide, spending 3 1/2 hours after school and 4 1/2 hours on Saturday. How many hours does she work each week?

3-12-1 UNIT TEST: COMMON FRACTIONS

I. Completion - Supply the missing word or words to make the following statements true.

1. In the fraction 3/16, 3 is called the _____ and 16 is called the _____.
2. 2/3 is a/an _____ fraction.
3. 6/5 is a/an _____ fraction.
4. 9/8 is written as 1 1/8. It is then called a/an _____ number.
5. Eight months is _____ of a year.
6. Three days is _____ of a week.
7. Eight inches is _____ of a foot.
8. Forty-five minutes is _____ of an hour.
9. 3/4 and 1/4 can be added or subtracted as they are because they have _____ _____.
10. The least common denominator for 7/10, 5/6, and 3/4 is _____.
11. The reciprocal of 2/3 is _____.
12. 7 1/2 is a _____ because it is made up of a _____ and a _____.

II. Reduce the following fractions to lowest terms:

1. 10/12 2. 16/24 3. 18/30 4. 12/32 5. 48/64 6. 24/36

7. 15/27 8. 18/42 9. 24/42 10. 9/15

III. 1. Use a ruler to determine the equivalent whole or mixed number.

(a) 2/2" (b) 4/4" (c) 8/8" (d) 4/2" (e) 24/8 "

2. Circle all of the proper fractions.

(a) 2/5 (b) 21/12 (c) 7/4 (d) 8/8 (e) 1/3 (f) 7/8

(g) 3/2 (h) 6/5 (i) 9/10 (j) 5/6

3. Circle all of the improper fractions.

(a) 32/32 (b) 1'' (c) 10/10 (d) 18/9 (e) 5/8

(f) 8/5 (g) 2/3 (h) 22/7 (i) 9/4 (j) 15/20

4. Find the lowest common denominator (L.C.D.) of each of the following:

(a) 1/8 and 1/6 (b) 7/12 and 2/3 (c) 1/3 and 1/4

(d) 1/3 and 4/5 (e) 1/10, 1/8, and 1/12 (f) 11/16, 5/8, and 11/4

(g) 2/3, 5/6, and 3/5

IV. Computations

Add:

1. (a) 1/5 + 2/5 (b) 7/16 + 9/16 (c) 1/3 + 1/5

(d) 2 1/3 (e) 9 (f) 7 13/16
5 1/3 5 13/16 2 1/4
1 5/8

Subtract:

2. (a) 13/15 (b) 1 (c) 25 1/6 (d) 4 1/4 (e) 5
7/8 25 3 1/3 4 4/5

(f) 10 3/4
2/3

Multiply:

3. (a) 1/3 x 3 (b) 48 x 3 11/16 (c) 8 1/3 x 4 7/10

(d) 2 5/8 x 1 5/6 (e) 1/16 x 16 (f) 1 3/4 x 2 1/2 x 3 1/7

Divide:

4. (a) 7/8 ÷ 1/8 (b) 3/5 ÷ 3 (c) 3 3/8 ÷ 4 2/5 (d) 58 ÷ 3 5/8

(e) 18 3/4 ÷ 1 9/16 (f) 6 ÷ 4 1/2

V. 1. How many pieces, 3/4 yd. each, can be cut from a piece 18 1/4 yds. long?

2. Mrs. Johnson found that she needed the following lengths of curtain material: 2 1/4 yd., 1 1/2 yd., and 2 3/8 yd. How many yards did she need in all?

3. A bakery salesgirl made the following sales of cookies: 1 3/4 doz., 2 2/3 doz., 1 5/6 doz., and 3 1/2 doz. If she had 10 dozen to sell, how many dozen remain to be sold?

4. Is 2/3 of 3/4 more or less than 3/4 of 2/3? How much more or less?

5. A clerk sold 27 1/2 yards of material on Monday, 36 yards on Tuesday, 21 1/2 yards on Wednesday, 16 yards on Thursday, 29 yards on Friday, and 42 yards on Saturday. Find his average daily sales. (Express solution as an improper fraction.)

INSTRUCTIONAL MATERIALS

3-0-0 Unit III: Fractions

3-3-0 Tape measure, rule

3-3-4 Activity sheet

3-4-0 Reducing or raising fractions to lowest terms
Tape measure and carpenter's rule

3-4-1 Filmstrip

3-4-2 Activity sheet

3-5-0 Arranging fractions in order

3-5-1 Measuring cups

3-5-2 Activity sheet

3-6-0 Common denominators and mixed numbers

3-6-1 Cassette tape

3-6-2 Cyclo-Teacher, M-73

3-7-0 Addition of fractions

3-7-1 Tape measure

3-7-2 Merrill skilltape

3-7-3 Activity sheet

3-8-0 Subtraction of fractions

3-8-1 Tape measure, rule

3-8-2 Overhead projector

3-8-3 Filmstrip

3-8-4 Merrill skilltape

3-8-5 Activity sheet

3-8-6 Cyclo-Teacher, M-73

3-9-0 Multiplication of fractions

3-9-1 Filmstrip

3-9-2 Merrill skilltape

3-9-3 Activity sheet

3-10-0 Division of fractions

3-10-1 Filmstrip

3-10-2 Overhead projector

3-10-3 Merrill skilltape

3-10-4 Activity sheet

3-11-0 Practical application of problems involving fractions
Overhead projector

3-11-2 Activity sheet

3-12-0 Evaluation

3-12-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT IV
cimal Fractions

4-0-0 At the end of this unit the students will demonstrate a basic knowledge of decimals and their application to house care services by scoring 70% or above on a teacher-made test.

4-1-0 Pretest administered to students to determine needs for numerical computations.

4-2-0 The project teacher will assign only the supplementary activities to students scoring 70% or above on the pretest. Students scoring below 70% will complete the entire unit.

4-3-0 The project teacher will use a place value chart with overhead projector and cassettes to read decimals, to change common fractions to decimal fractions and to change decimal fractions to common fractions.

4-3-1 Activity: Reading Decimals

4-3-2 Merrill skilltape (Understanding Decimals, A and B)

4-3-3 Study Chart - Fractional Equivalents

4-3-4 Activity: Changing Common Fractions to Decimals

4-3-5 Cyclo-Teacher, M-81

4-3-6 Activity: Changing Decimals to Common Fractions

4-4-0 The project teacher will use a place value chart to compare decimals.

4-4-1 Lecture with students using a place value chart to compare decimals.

4-4-2 Activity: Comparing Decimals, Using $>$, $<$, and $=$ symbols.

4-4-3 Activity: Comparing Decimals

4-5-0 By use of the overhead projector and filmstrips, the project teacher will teach basic addition and subtraction of decimals.

4-5-1 Lecture using overhead projector

4-5-2 Filmstrips

4-5-3 Activity: Addition and Subtractions of Decimals and Exercises pertaining to House Care Services

4-6-0 By use of programmed materials, the project teacher will give a basic understanding of multiplying decimals.

4-6-1 Cyclo-Teacher, M-85

4-6-2 Merrill skilltapes (Operation with Decimals, A and B)

4-6-3 Activity: Multiplying Decimals

4-7-0 Using the overhead projector, the project teacher will teach the concept of multiplying a decimal by 10, 100, 1000, .1, .01, and .001.

4-7-1 Study Sheet: Multiplying Decimals by 10, 100, 1000, .1, .01, and .001

4-7-2 Activity: Multiplying Decimals by Powers of 10

4-8-0 Using programmed materials, the project teacher will give a basic understanding of dividing decimals.

4-8-1 Cyclo-Teacher, M-87 and M-88

4-8-2 Merrill skilltapes (Operation with Decimals, B)

4-8-3 Activity: Dividing Decimals

4-9-0 By use of the overhead projector and filmstrips, the project teacher will introduce the concept of dividing a decimal by 10, 100, 1000, .1, .01, and .001.

4-9-1 Study Sheet: Dividing by 10, 100, 1000, .1, .01, and .001

4-9-2 Activity: Dividing by the Powers of 10

4-10-0 The project teacher will use chalkboard and lecture to teach problem solving related to house care services.

4-10-1 Lecture

4-10-2 Activity: Problem Solving - Exercises Involving Decimals Related to House Care Services

4-11-0 The project teacher will administer a unit test.

4-11-1 Unit Test

4-1-0 **Pretest:** Decimal Fractions

Time limit - five minutes each section

I. Add.

1. .2 + .002 + 200.02 + 2.0002
2. 6.75 + .001 + .019 + 416.5 + 6.1875
3. 18.03 + 41.8 + 607.31 + 7.004
4. 2.6 + .0004 + 111.721 + 4.006 + .08
5. 5.0246 + 120.728 + 14.2061 + 7.5

II. Subtract.

1. 218.96 - 143.25
2. 2.164 - .2164
3. 22.366 - 18.64
4. 46.3852 - 9.1432
5. .064 - .0064

III. Multiply.

1. .25 X .04
2. 7.04 X .08
3. 87.6 X 9.24
4. .95 X 6.24
5. 50.9 X 50.7

IV. Divide.

1. 2688 ÷ .56
2. 8 ÷ 5
3. 1.400 ÷ 1.75
4. 8.66667 ÷ .3
5. 3.1416 ÷ .006

4-3-1 Activity: Reading Decimals

Write in words or read each of the following decimals:

1. .7
2. .008
3. .1416
4. .03
5. .1316
6. .0175
7. 6.543
8. 65.43
9. .0652
10. 620.2
11. 62.02
12. 6.202
13. .007
14. .00625
15. .14159

4-3-3 Study Sheet: Fractional Equivalents

The following list of equal fractions and decimals should be memorized.

1/2 = .5 or .50

1/3 = .33 1/3

2/3 = .66 2/3

1/4 = .25

3/4 = .75

1/5 = .2 or .20

2/5 = .4 or .40

3/5 = .6 or .60

4/5 = .8 or .80

1/6 = .16 2/3

5/6 = .83 1/3

1/8 = .12 1/2

3/8 = .37 1/2

5/8 = .62 1/2

7.8 = .87 1/2

1/10 = .1 or .10

3/10 = .3 or .30

7/10 = .7 or .70

9/10 = .9 or .90

1/12 = .08 1/2

1/ 16 = .C6 1/4

4-3-4 Activity: Changing Common Fractions to Decimal Fractions

To change common fractions to decimal fractions let the denominator tell you what place the numerator is to be written. If you wish to change 8/10 to a decimal, the denominator tells you to write 8 in the tenths' place, one place to the right of the decimal point, as .8. In writing 8.100, the 8 must be written in the hundreths' place, which is two places to the right of the decimal point; since 8 can only occupy one of those two places, the first one must be filled with a zero. 8/100 = .08, 8/1000 = .008.

I. Change these common fractions to decimal fractions.

1. 9/10
2. 4/100
3. 28/100
4. 8/100
5. 12/100
6. 5/1000
7. 4/1000
8. 1/1000
9. 4375/10,000
10. 5/1000
11. 3/10,000
12. 89/1000
13. 1416/10,000
14. 38/100
15. 1875/10,000
16. 1428/10,000
17. 375/10,000
18. 39/1000
19. 84/100
20. 45/1000

II. Any fraction can be changed to a decimal fraction by dividing the numerator by the denominator, annexing zeros after the point in the numerator. In many cases the divisor does not end. In such cases it is necessary to specify the number of places in the quotient.

Example: Find the decimal equivalent to 3/7 to 3 decimal places. The quotient is carried to 4 decimal places and is rounded at the third decimal place.

$$3/7 = 7\overline{)3.0000}\quad .4285$$

$$\begin{array}{r} 28 \\ \hline 20 \\ 14 \\ \hline 60 \\ 56 \\ \hline 40 \\ 35 \\ \hline 5 \end{array}$$

4-3-6 **Activity:** C inging Decimals to Common Fractions

To change a decimal fraction to an equal common fraction, omit the decimal point and write the digits as the numerator of a fraction. For the denominator, write 1 followed by as there are decimal places in the decimal. Reduce the fraction to lowest terms.

Example: $.75 = \frac{75}{100} = 3/4$

$.125 = \frac{125}{100} = 1/8$

$1.6 = \frac{16}{10} = 8/5$

I. Change the following to fractions and reduce to lowest terms.

1. .17
2. .28
3. .095
4. 1875
5. .052
6. .95
7. 18
8. .076
9. .9
10. .04
11. .500
12. 1.675
13. 16.7
14. .375
15. .08
16. .050
17. .0175
18. 19.775
19. .0007
20. .6000

II. Sometimes the fraction is a complex fraction. A complex fraction is one whose numerator or denominator, or both, is a fraction or a mixed number. Reduce the resulting fraction to lowest terms.

Example: $.16\ 2/3 = \frac{16\ 2/3}{100} = \frac{16\ 2/3 \times 3}{100 \times 3} = \frac{50}{300} = \frac{1}{6}$

Change each of the following decimal fractions to common fractions in the above manner. Reduce to lowest terms.

1. .03 3/4
2. .033 1/3
3. 583 1/3
4. .01 2/3
5. .93 1/3

Find the decimal equivalent of each of the following fractions to the nearest hundredth (Hint: carry the quotient to 3 decimal places). Use the table if applicable.

1. 4/9	6. 4/13	11. 5/8
2. 8/9	7. 4/5	12. 7.8
3. 1/2	8. 1/8	13. 2/3
4. 5/12	9. 3/4	14. 17/32
5. 1/5	10. 7/11	15. 5/6

III. Another method for changing some fractions to decimals is as follows:

$$3/4 = \frac{3 \times 25}{4 \times 25} = \frac{75}{100} = .75$$

$$2/5 = \frac{2 \times 2}{5 \times 2} = \frac{4}{10} = .4$$

Express each fraction as a decimal in the above manner.

1. 1/2	6. 4/500	11. 9/50
2. 4/5	7. 13/50	12. 12/25
3. 6/25	8. 12/25	13. 8/25
4. 1/1	9. 3/50	14. 2/500
5. 2/20	10. 8/20	15. 2/25

4-4-2 Activity: Comparing Decimals Using the Symbols $>$ (greater than), $<$ (less than), or $=$ (equal to) to compare Decimal Fractions

Using the symbols $>$, $<$, or $=$, compare the following decimal fractions.

1. .5 and .51
2. .5 and .50
3. .25 and .207
4. .004 and .003
5. 1.3 and .57
6. .4 and .42
7. .5 and .09
8. .001 and .0001
9. .9 and .85
10. .65 and .597

4-4-3 Activity: Comparing Decimals

I. Circle the numbers that are nearer to:

1. 0.1 than 0.2 : 0.17, 0.11, 0.19, 0.13, 0.16

2. .5 than .6 : .58, .52, .57, .54, .59

3. 8 than 9 : 8.2, 8.709, 8.49, 8.51, 8.634

4. .246 than .247 : .2467, .2463, .2406, .2460, .2468

5. .1 than .2 : .13, .16, .19, .11, .17

II. Arrange the following in order of their size, the <u>largest</u> first and the <u>smallest</u> last.

1. 7., 5.4, .816

2. 1.7, 3.2, 1.4

3. .004, .035, .09

4. .085, .207, .009

5. 6, 59, 8

6. .93, 5., 8.2

7. .25, 167, .167

8. .5, 16, .09

9. .08, .49, .60

10. .625, 1.7, 3

III. In each column rearrange the numbers in the order of their size, with the <u>smallest</u> first and the <u>largest</u> last.

1. (a) .007
   (b) .07
   (c) .7
   (d) 700
   (e) 7

2. (a) .0375
   (b) .3.75
   (c) 3750
   (d) 37.5
   (e) .375

3. (a) .5201
   (b) 5.201
   (c) 52.01
   (d) 520.1
   (e) 5201

4. (a) 6.543
   (b) 6543
   (c) 65.43
   (d) .6543
   (e) 654.3

5. (a) 982.5
   (b) 98.25
   (c) 9.825
   (d) 9825
   (e) .9825

4-5-3 Activity: Addition and Subtraction of Decimals and Exercises Pertaining to Home Care Services

Solve the following decimal fractions:

I. Add:

1. .7 + .128 + 16
2. .49 + 5
3. .07 + .3
4. .2 + .02 + .002 + 200.02 + 2.0002
5. 81.73 + .019 + 416.5 + 6.1875
6. 6.75 + .001 + 41.786 + 97.84 + 87.16 + .0068
7. .0987 + .0023 + 34.678 + 234.09 + 456.098
8. 8.675 + 9.867 + 42.365 + 96.147 + 415.63 + 168.75
9. 18.65 + 618.17 + 416.8 + 12.364 + 31.973 + .0681
10. Eighty-six thousandths, eight hundred sixty, eight and six tenths, eighty-six-ten-thousandths
11. Five thousand sixty-eight, forty-eight and six tenths, fifty-six and eighty-seven hundredths, forty-six and seven hundred thirteen thousandths

II. Subtract:

1. .11 - .1 2. .1 - .01 3. 2 - .2 4. .765 - .723
5. 4.273 - .08 6. .048 - .03 7. 2.7 - .015
8. .7 - .026 9. .564 - .561
10. Seven minus four and nine tenths
11. Seven hundred forty-one thousandths minus two hundred thirty-nine thousandths

III. Add or Subtract:

1. Mr. Richardson hired four boys to help in the store on the day of the Christmas rush. John earned $5.35, Tom earned $4.75, Harry earned $2.63, and Bob only $.98. How much did the extra help cost Mr. Richardson?

2. In one department of a store, the sales of eight clerks were: $349.80, $412.60, $495.75, $298.61, $364.75, $409.75, $297.00, $463.92. What is the total sales for the week?

3. A worker who has $1,746.80 in the bank draws checks as follows: $230.00, $156.75, $175.35, $174.35, $116.00. How much does she have left?

4-6-3 Activity: Multiplying Decimals

Multiply the following:

1. $\begin{array}{r} .5 \\ \times\ 3 \end{array}$ $\begin{array}{r} 9 \\ \times\ .2 \end{array}$ $\begin{array}{r} .24 \\ \times\ 6 \end{array}$ $\begin{array}{r} 2.9 \\ \times\ .8 \end{array}$ $\begin{array}{r} .165 \\ \times\ 4 \end{array}$

2. $\begin{array}{r} 3.89 \\ \times\ .6 \end{array}$ $\begin{array}{r} 7.29 \\ \times\ .13 \end{array}$ $\begin{array}{r} .006 \\ \times\ .23 \end{array}$ $\begin{array}{r} 13.08 \\ \times\ .06 \end{array}$ $\begin{array}{r} 4.09 \\ \times\ 4.09 \end{array}$

3. $\begin{array}{r} 3.9 \\ \times\ .26 \end{array}$ $\begin{array}{r} 6.329 \\ \times\ .012 \end{array}$ $\begin{array}{r} .01 \\ \times\ .01 \end{array}$ $\begin{array}{r} .0054 \\ \times\ 1.234 \end{array}$ $\begin{array}{r} .4 \\ \times\ .2613 \end{array}$

4. $\begin{array}{r} .118 \\ \times\ .922 \end{array}$ $\begin{array}{r} 1.0964 \\ \times\ .02 \end{array}$ $\begin{array}{r} .8075 \\ \times\ .001 \end{array}$ $\begin{array}{r} .006 \\ \times\ .3 \end{array}$ $\begin{array}{r} .078 \\ \times\ .8 \end{array}$

5. $\begin{array}{r} \$23{,}500 \\ \times\ .002 \end{array}$ $\begin{array}{r} \$19{,}200 \\ \times\ .025 \end{array}$ $\begin{array}{r} \$348.20 \\ \times\ .006 \end{array}$ $\begin{array}{r} \$57.80 \\ \times\ .87\ 1/2 \end{array}$ $\begin{array}{r} \$95.90 \\ \times\ .16\ 2/3 \end{array}$

6. A lot in Natchitoches is sold for $137. per square foot. What is the price of the lot if it is 27.4 feet wide and 97.3 feet deep?

7. The Electric Appliance Company obtains the agency for a vacuum cleaner. The commission is to be figured each month on the number of cleaners sold as follows: $12.50 each for the first 50 cleaners; $15 each for the second 50 or part thereof; $17.50 each for all over 100 cleaners sold each month. In April, 76 cleaners were sold and in May, 105. Find the total commission for the two months.

8. The May reading on a gas meter was 71,400 cubic feet while the April reading was 67,800 cubic feet. At 95¢ per thousand cubic feet, find the amount of the gas bill.

9. If a profit of $.95 is made on each window cleaned, how much profit is made if 50 windows are cleaned?

4-7-1 Study Sheet: Multiplying Decimals by 10, 100, 1000, .1, .01 and .001.

Multiplication of any decimal by a power of 10 can be accomplished simply by moving the decimal the correct number of places to the right or left.

To multiply by 10, 100 or 1000, move the decimal point to the right in the multiplicand as many places as there are zeros in the multiplier, annexing zeros if necessary.

Examples:

10 x 6.26 = 62.6	10 x $4.25 = $42.50
100 x 6.26 = 626	100 x $4.25 = $425
1000 x 6.26 = 6260	1000 x $4.25 = $4,250

To multiply by .1, .01, or.001 and so on, rewrite the multiplicand and move its decimal point to left as many places as there are decimal places in the multiplier. Prefix zeros if necessary.

Examples:

.1 x 64.5 = 6.45	.1 x $7.50 = $.75
.01 x 64.5 = .645	.01 x $7.50 = $.075 = $.08
.001 x 64.5 = .0645	.001 x $3450 = $3.45
.0001 x 64.5 = .00645	.0001 x $3450 = $.3450 = $.35

MENTAL

Write only the product:

1. 10 x 7.56	11. .01 x 8.2
2. 100 x 6.21	12. .001 x 698
3. 1000 x 5.73	13. .1 x 5.31
4. 100 x 9.86	14. 3681 x .001
5. 10 x 6.342	15. 6.7 x .01
6. 100 x .085	16. 967 x .1
7. 1000 x .024	17. .01 x 5.66
8. 10 x .071	18. 9.32 x .01
9. .594 x 1000	19. 94.2 x .1
10. 5.65 x 10	20. 844 x .001

4-7-2 Activity: Multiplying Decimals by powers of 10.

Multiplication of any decimal by a power of 10 can be accomplished simply by moving the decimal the correct number of places to the right or left.

Multiply the following:

1. 79.5 x .1
2. 4.64 x 10
3. .921 x 1000
4. 4.63 x .001
5. .071 x 100
6. 715 x .01
7. .074 x 100
8. .031 x 1000
9. 100 x 5.08
10. .045 x 10
11. 47.2 x 100
12. 9.38 x 10
13. .1 x .1
14. .00024 x 1000
15. .725 x .1
16. 123.4 x .01
17. 10 x 9.01
18. 100 x 2.01
19. .01 x 8.26
20. .550 x .1

4-8-3 Activity: Dividing Decimals

To divide a decimal by a whole number, divide as in regular division and place the decimal above where it is located in the dividend.

Example: $4\overline{).36}$ → $.09$

$\underline{0}$

36

$\underline{36}$

Check: $.09 \times 4 = .36$

$4\overline{)6.4}$ → 1.6

$\underline{4}$

24

$\underline{24}$

Check: $1.6 \times 4 = 6.4$

I. Divide and check the following:

1. $4\overline{)4.8}$
2. $3\overline{)9.3}$
3. $38\overline{).266}$
4. $3\overline{)18.06}$
5. $48\overline{)36.00}$
6. $25\overline{)\$7.25}$
7. $9\overline{)81.00}$
8. $70\overline{)\$49.98}$
9. $16\overline{).0032}$
10. $4\overline{)\$8.00}$

II. Solve the following:

1. Mrs. Gair's grocery expenses for 7 days were $60.98. What was her average expense per day?
2. If 10 yards of curtain material cost $35.00, what does 1 yard cost?
3. If 15 gallons of cleaning fluid weighs 98.4 pounds, what does one gallon weigh?
4. If a profit of $.95 is made on each floor cleaned, how many floors will have to be cleaned to earn a profit of $47.50?
5. What is the average speed in miles per hour of a car that is driven 340 miles in 7.75 hours?

4-9-1 Study Sheet: Dividing by 10, 100, 1000, .1, .01, and .001

To divide by 10, 100, or 1000, etc., move the decimal point to the left in the dividend as many places as there are zeros in the divisor.

Examples: 5,300 ÷ 10 = 530
925 ÷ 100 = 9.28
6,200 ÷ 1000 = 6.2
86.2 ÷ 10 = 8.62
64 ÷ 100 = .0064
962.5 ÷ 1000 = .9625

When the divisor is .1, .01, or .001, etc., rewrite the dividend and move its decimal point to the right as many places as there are in the divisor. Annex zeros if necessary.

Examples: 385 ÷ .1 = 3850
.0934 ÷ .01 = 9.34
6.5 ÷ .001 = 6500
$13.25 ÷ .1 = $132.5
$ 2.60 ÷ .01 = $2.60
$19.98 ÷ .001 = $19,980

Perform orally:

1. 625 ÷ 10
2. 72.6 ÷ 10
3. 7.3 ÷ 100
4. 5.73 ÷ 1000
5. 79.4 ÷ .1
6. .485 ÷ .001
7. 4.66 ÷ .01
8. .23 ÷ .1
9. 40 ÷ 1000
10. 4.2 ÷ 10
11. 2.41 ÷ .1
12. 73.26 ÷ .01
13. .253 ÷ .001
14. 7.2 ÷ .1
15. .74 ÷ .001
16. 23.9 ÷ 10
17. 2.52 ÷ 1000
18. .902 ÷ .01
19. .201 ÷ .001
20. 9.3 ÷ .01

4-9-2 Activity: Dividing by the Powers of 10

Solve each of the following by moving the decimal point to the correct position:

1. 8400 ÷ 100
2. 6.3 ÷ .1
3. .625 ÷ 10
4. 9.2 ÷ .01
5. .28 ÷ .1
6. .014 ÷ .01
7. 8 ÷ 1,000
8. .2463 ÷ .001
9. 8.5 ÷ 1,000
10. .705 ÷ .001
11. 9.24 ÷ .01
12. 5,000,000 ÷ 1,000
13. .36 ÷ 100
14. .036 ÷ .001
15. 895 ÷ 1,000
16. 7.92 ÷ 10
17. 6.293 ÷ .01
18. 1,986 ÷ 1,000
19. 15.036 ÷ 10
20. 5.65 ÷ .01
21. 63.8 ÷ 100
22. .37 ÷ 10
23. 6.49 ÷ 1,000
24. 1.6428 ÷ 1,000
25. .84 ÷ .001
26. .53 ÷ .1
27. 6,390 ÷ 10,000
28. 6 ÷ 10
29. .012 ÷ .01
30. 53.4 ÷ .001

4-10-2 Activity: Problem Solving - Exercises Involving Decimals Related to House Care Services

1. If 10 yards of drapery material cost $80.50, what is the cost of one yard?

2. Finding the average monthly income of the following cleaning service:

Cleaning Record of Jones Cleaning Service
Period from Jan. 1 to July 1

January	$ 726.84	April	$1,284.63
February	1,521.96	May	989.17
March	1,172.83	June	1,243.26

3. An interior decorator listed her income for the first eight years as follows: $8,320.60, $7,443.20, $9,680.50, $10,220.40, $11,110.50, $9,620.00, $10,250.30, and $11,250.70.
What years income was nearest to the average, and how much was this amount above or below the average?

4. Find the total cost for each of the following:

   (a) 84 doz. pairs of hinges @ $16.25

   (b) 124 doz. screwdrivers @ $7.50

   (c) 12 gallons of cleaning fluid @ $2.50

5. Mary, whose hourly rate of wages at College Cleaners is $1.60, received $54.00 for a week of work. How many hours did she work if she received not overtime pay?

6. What is the cost of 25 yds. of drapery material at $2.80 per yard?

7. Mrs. Reed hired a cleaning service company to clean her floors at $2.25 an hour. If the man worked for 5 hours and materials for the job were $19.85, what was the total cost of the job?

8. A factory estimated that the labor cost of assembling a certain kind of vacuum cleaner was $18.00. During one week, 22 machines of this kind were assembled by 6 men. If all the men on this job received the same pay, what amount would each receive for the week?

4-11-1 UNIT TEST: DECIMAL FRACTIONS

I. Fill in the following blanks:

1. To multiply a decimal by 10, move the decimal point _____ _____ to the _____. To multiply by 100, move the decimal point _____ _____ _____ _____ _____.

2. To divide a decimal by 10, move the decimal point _____ _____ to the _____. To divide a decimal by 100, move the decimal point _____ _____ to the left.

3. To multiply decimals, multiply like whole numbers and then point off as many decimals in the product as there are in the _____ and _____ combined.

4. 5 thousands requires _____ zeros between the 5 and the point.

5. 5 thousandths requires _____ zeros between the 5 and the point.

6. Hundredths are _____ places to the right of the point.

7. Hundreds are _____ places to the left of the point.

8. Tenths are written _____ places to the right of the decimal point.

9. But tens are written _____ places to the left of the point.

10. The 4'rth place to the right of the decimal point is called _____.

11. The 4'rth place to the left of the point is called _____.

12. The 5'th place to the left of the point is called _____.

13. The 5'th place to the right of the point is called _____.

14. 9 hundreds is written _____.

15. 9 hundredths is written _____.

16. In writing cents, _____ decimal places are used.

17. In writing 7 thousand, _____ zeros are used.

18. In writing 7 thousandths, _____ zeros are used.

19. 3 in the hundredths' place is written _____.

20. However, 3 in the hundreds' place is written _____.

II. Change the following fractions to decimal fractions:

(1) 4/10 (2) 36/1000 (3) 13/100 (4) 8/1000 (5) 68/10,000

(6) 128/1000 (7) 46/100 (8) 1/10 (9) 999/10,000 (10) 202/1000

III. Change the following to decimals. Round to the nearest hundredth when applicable.

(1) 1/4 (2) 1/3 (3) 2/3 (4) 5/7 (5) 7/11 (6) 4/5

IV. Change the following to common fractions and reduce to lowest terms:

(1) .4 (2) .05 (3) .475 (4) .50 (5) 1.85 (6) .5725

(7) 1.675 (8) .60

V. Use the symbols (>, <, =) to compare the following:

(1) .5 _____ .55 (2) .04 _____ .004

(3) .8 _____.800 (4) .3671 _____.367

(5) 1.25 _____1.205 (6) .999 _____.9999

VI. Arrange the following in order, from least to greatest.

(1) .07, .007, .7, .707 (2) .621, .62101, .621001, .621101

VII. Add the following:

(1) 45.64
2.35
39.6
5.006

(2) 73.2 + 41.024 + 832.0006

(3) .004 + 7.0007 + 4.444

VIII. Subtract the following:

(1) 97.754
32.981

(2) 68.742 - 23.46

(3) 17 - 8.9

IX. Multiply the following:

(1)	(2)	(3)	(4)
39.6	297.3	87.32	.2
.43	4.62	.006	.4

X. Divide the following:

(1) .25 .875 (2) .7 2.814 (3) .04 16.8 (4) 1.25 .675

XI. Solve the following:

(1) If 20 yards of curtain material cost $70.00, what does 1 yard cost?

(2) A clerk was paid $194.00 for 40 hours of work. What was her hourly rate?

(3) At 85c per thousand cubic feet for gas, what is the bill of a family consuming 7840 cubic feet of gas?

INSTRUCTIONAL MATERIALS

4-0-0 Unit IV: Decimal Fractions

- 4-1-0 Pretest
- 4-3-0 Place value chart, overhead projector
  - 4-3-1 Activity sheet
  - 4-3-2 Merrill skilltape (Understanding Decimals, A and B)
  - 4-3-3 Study chart
  - 4-3-4 Activity sheet
  - 4-3-5 Cyclo-Teacher, M-81
  - 4-3-6 Activity sheet
- 4-4-0 Comparing Decimals
  - 4-4-1 Place value chart
  - 4-4-2 Activity sheet
  - 4-4-3 Activity sheet
- 4-5-0 Addition and Subtraction of Decimals
  - 4-5-1 Overhead projector
  - 4-5-2 Filmstrip
  - 4-5-3 Activity sheet
- 4-6-0 Multiplication of Decimals
  - 4-6-1 Cyclo-Teacher, M-85
  - 4-6-2 Merrill skilltapes (Operation with Decimals, A and B)
  - 4-6-3 Activity sheet
- 4-7-0 Multiplying Decimals by 10, 100, 1000, .1, .01, and .001
  - 4-7-1 Study sheet
  - 4-7-2 Activity sheet

4-8-0 Dividing Decimals

4-8-1 Cyclo-Teacher, M-78 and M-88

4-8-2 Merrill skilltapes (Operation with Decimals, B)

4-8-3 Activity sheet

4-9-0 Dividing Decimals by 10, 100, 1000, .1, .01, and .001

4-9-1 Activity sheet

4-10-0 Problem Solving

4-10-2 Activity sheet

4-11-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT V
Percents

5-0-0 Upon completion of this unit, the students will show a basic understanding of percentage and how percentage problems may be applied to house-care services, as evidenced by scoring 70% or above on a teacher-made test.

5-1-0 The project teacher will adminsiter a pretest on percents to determine the basic needs of the students.

5-2-0 The project teacher will use Wollensak tapes, filmstrips, and lecture to introduce the concept of percentage.

5-2-1 Lecture on use of percents in house care services

5-2-2 Wollensak skilltape, #C-3151

5-2-3 Filmstrip - "Understanding Percents"

5-3-0 The project teacher will use Wollensak tapes, Cyclo-Teacher, lecture and transparencies to teach changing fractions to percents.

5-3-1 Lecture and transparencies

5-3-2 Wollensak skilltape, #C-3151

5-3-3 Study Sheet: Table of Equivalent Fractions

5-3-4 Activity: Changing Common Fractions to Percents

5-3-5 Cyclo-Teacher

5-4-0 The project teacher will use Wollensak tapes, Cyclo-Teacher, lecture, and transparencies to teach changing percents to common fractions.

5-4-1 Wollensak skilltape, #C-3151

5-4-2 Activity: Changing Percents to Common Fractions

5-4-3 Cyclo-Teacher

5-5-0 The project teacher will use Wollensak tapes, transparencies, Cyclo-Teacher, and lecture to teach changing decimal fractions to percents.

5-5-1 Lecture and transparencies

5-5-2 Wollensak skilltape, #C-3151

5-5-3 Activity: Changing Decimal Fractions to Percents

5-5-4 Cyclo-Teacher

5-6-0 The project teacher will use Wollensak tapes, transparencies, Cyclo-Teacher, and lecture to teach changing percents to decimal fractions.

5-6-1 Lecture and transparencies

5-6-2 Wollensak skilltape, #C-3154

5-6-3 Activity: Changing Percents to Decimal Fractions

5-6-4 Cyclo-Teacher

5-7-0 The project teacher will use Wollensak tapes, Cyclo-Teacher, transparencies, and lecture to teach finding a percent of a number by changing the percent to a common fraction, then multiplying.

5-7-1 Lecture and transparencies

5-7-2 Wollensak tape

5-7-3 Activity: Finding a Percent of a Number by Changing Percents to Common Fractions and Multiplying

5-7-4 Cyclo-Teacher

5-8-0 The project teacher will use Wollensak tapes, Cyclo-Teacher, transparencies, and lecture to teach finding a percent of a number by changing the percent to a decimal fraction and multiplying.

5-8-1 Lecture and transparencies

5-8-2 Wollensak tape

5-8-3 Cyclo-Teacher

5-8-4 Activity: Finding a Percent of a Number by Changing Percents to Decimal Fractions and Multiplying

5-9-0 The project teacher will use lecture and a teacher-prepared exercise to teach finding what percent one number is of another.

5-9-1 Lecture using overhead projector

5-9-2 Activity: Finding What Percent One Number is of Another

5-10-0 The project teacher will use lecture and examples of practical problems to teach problem solving.

5-10-1 Activity: Problem Solving of Percents Related to House Care Services

5-11-0 The project teacher will administer a teacher-made test on percentage problems.

5-11-1 Unit Test

5-1-0 Pretest: Percents

I. Change to percents.

1. .15	2. .7	3. .001	4. .0005
5. .825	6. 1.725	7. 3.14	8. .6 1/2
9. .25 1/4	10. 18.2		

II. Change to percent. (to the nearest tenth of one percent)

1. 1/8	2. 2/3	3. 1/4	4. 3/4
5. 1/3	6. 3/500	7. 5/13	8. 14/5
9. 5/10	10. 1/2		

III. Change to decimal fractions.

1. 5%	2. 3.5%	3. 45%	4. 8 1/2%
5. 1/2%	6. 13.5%	7. 675%	8. 235.2%
9. .3%	10. .475%		

IV. Change to common fractions. Express answer in lowest terms.

1. 25%	2. 50%	3. 35%	4. .25%
5. 0.5%	6. 40%	7. 66 2/3%	8. 83 1/3%
9. 16 2/3%	10. 36%		

V. Solve the following:

1. 35% of 85 = _____.
2. 24 = _____% of 20.
3. 48 = _____% of 60.
4. 150 increased by 25% = _____.
5. 20% less than 40 = _____.
6. 1/2% of 600 = _____.
7. 3 is what percent of 4? ____
8. What percent of 18 is 9_____
9. 18 is what percent of 25_____
10. What percent of 43 is 43_____

TABLE I

5-3-3 Study Sheet: Table of Equivalents, Percents, Decimals, and Common Fractions

COMMON FRACTIONS	DECIMALS	PERCENTS
1/4	.25	25%
1/2	.50	50%
3/4	.75	75%
1	1.00	100%
1/8	.12 1/2 or .125	12 1/2% or 12.5%
3/8	.37 1/2 or .375	37 1/2% or 37.5%
5/8	.62 1/2 or .625	62 1/2% or 62.5%
7/8	.87 1/2 or .875	87 1/2% or 87.5%
1/5	.20 or .2	20%
2/5	.40 or .4	40%
3/5	.60 or .6	60%
4/5	.80 or .8	80%
1/3	.33 1/3	33 1/3%
2/3	.66 2/3	66 2/3%
1/6	.16 2/3	16 2/3%
5/6	.83 1/3	83 1/3%
1/10	.10 or .1	10%
3/10	.30 or .3	30%
7/10	.70 or .7	70%
9/10	.90 or .9	90%
1/20	.05	5%
1/16	.06 1/4	6 1/4%
1/12	.08 1/3	8 1/3%

5-3-4 Activity: Changing Common Fractions to Percents

Change the following common fractions to percents:

1. 1/2 = _____%
2. 2/5 = _____%
3. 1/4 = _____%
4. 11/25 = _____%
5. 18/300 = _____%
6. 21/50 = _____%
7. 3/20 = _____%
8. 1/100 = _____%
9. 1/3 = _____%
10. 5/100 = _____%
11. 5/50 = _____%
12. 3/8 = _____%
13. 5/6 = _____%
14. 4/5 = _____%
15. 8/12 = _____%
16. 60/72 = _____%
17. 12/14 = _____%
18. 9/10 = _____%
19. 30/600 = _____%
20. 3/4 = _____%

5-4-2 Activity : Changing Percents to Common Fractions

Change the following percents t common fractions or mixed numbers. Express each answer in lowest terms.

1. 50% = _____
2. 25% = _____
3. 30% = _____
4. 33 1/3% = _____
5. 36% = _____
6. 8 1/3% = _____
7. 83 1/3% = _____
8. 100% = _____
9. 125% = _____
10. 390% = _____
11. 266 2/3% = _____
12. 612 1/2% = _____
13. 1000% = _____
14. 12 1/2% = _____
15. .1% = _____
16. 300% = _____
17. 22 3/4% = _____
18. 89 1/2% = _____
19. 133 1/3% = _____
20. 15% = _____

5-7-3 Activity : Finding a Percent of a Number by Changing Percents to Common Fractions and Multiplying

Change the percents to a common fraction and multiply.

Example: 75% of 120
3/4 X 120 = 360/4 = 90

125% of 400
1 1/4 X 400
5/4 X 400 = 500

1. 45% of 85
2. 56% of 615
3. 12 1/2% of 98
4. 15% of 98
5. 5% of 82
6. 36% of 4.25
7. 63% of 120
8. 4% of 60
9. 10% of 20
10. 45% of 7
11. 4% of 8,200
12. 6% of 148
13. 200% of 22
14. 20% of 645
15. 40% of 80
16. 0.1% of 12,000
17. 4 2/3 of 969
18. 128% of 9
19. 1/4% of 36
20. 6 1/4% of 24

5-5-3 Activity : Changing Decimal Fractions to Percents

To express a decimal fraction as a percent, write the digits of the numeral naming the given decimal. Move the decimal point two places to the right and write the percent symbol after the numeral. In a percent the decimal point is not written after the last digit. For example: .25 = 25%, .0002 = .02%, .812 = 81.2%, .6 = .60 = 60%.

1.	.37	.64	.18	.43
2.	.07	.03	.09	.002
3.	23.8	1.47	135.2	1.66 2/3
4.	.05	.5	.005	.01
5.	.583	.609	.134	.042
6.	.9752	.1859	.7806	.0647
7.	.3628	.0583	.00 7/8	.00 3/4
8.	.06 1/2	.9	.08	.24
9.	.06 1/2	6.02	8	7.00

5-6-3 Activity Changing Percents to Decimal Fractions

To change a percent to a decimal, move the decimal point two places to the left, and drop the percent symbol.
Example: 23.8% = .238, 45% = .45, 240% = .24, 33 1/3% = .33 1/3

Express each of the following percents as a decimal.

1.	25%	67%	16%	19%
2.	175%	100%	103%	278%
3.	6%	99%	9%	15%
4.	1%	80%	49%	77%
5.	4%	76%	0.5%	2%
6.	.07%	6.3%	13.2%	1 1/4%
7.	103.4%	67%	180%	83 1/3%
8.	120%	4.7%	62 1/2%	3 1/4%
9.	160%	194%	268%	.0875%
10.	5 3/4%	0.2%	4.7%	1/8%

5-8-4 Activity: Finding a Percent of a Number by Changing Percents to Decimal Fractions and Multiplying.

Solve the following problems by changing the percent to a decimal and then multiplying.

Example: 48% of 85
.48 X 85 = 40.80

1.	29% of 140	93% of 625	82% of 3,000
2.	4% of 80	9% of 29	1% of 3,265
3.	10% of 40	30% of 7	40% of 8,225
4.	26 1/2% of 52	84 1/4% 964	65 3/4% of 1,000
5.	6 1/4% of 24	5 1/2% of 10	1 1/2% of 1,284
6.	8.3% of 60	1.6% of 22.5	7.8% of 3.25
7.	18.72% of 200	70.05% of 426	57.8% of 6,456
8.	100% of 20	500% of 190	300% of 9.26
9.	1/2% of 250	1/4% of 100	1/2% of 22.64
10.	7/8% of 600	3/8% of 48	1/6% of 9,000
11.	.09% of 70	0.3% of 27	0.6% of 54
12.	0.53% of 2,000	0.89% of 3,000	0.29% of 2

5-9-2 Activity: Finding What Percent One Number is of Another

To find what percent one number is of another:

First: Express the ratio as a common fraction.

Second: Express the fraction as a percent.

Example: 12 is what percent of 36
12/36 = 1/3
1/3 = .33 1/3
.33 1/3 = 33 1/3%

Solve the following:

1. 35 is what percent of 49?
2. 25 is what percent of 40?
3. What percent of 45 is 50?
4. What percent of 16 is 20?
5. 17 is what percent of 136?
6. What percent of 48 is 32?
7. 60 is what percent of 12?
8. 2 is what percent of 4?
9. 15 is what percent of 60?
10. What percent of 100 is 40?
11. What percent of 64 is 8?
12. 3 is what percent of 60?
13. If a store received 24 bolts of material and 6 bolts were ruined, what percent was ruined?
14. If 30 yards of upholstery material cost $50.00 and retailed for $75.00, what percent of the retail price is cost?

5-10-1 Activity : Problem Solving of Percents Related to Housecare Services

1. In the furniture department of Choate's Furniture Store, a discount of 10% is given for cash. How much would Mrs. Gair have to pay for a sofa priced at $300, if she paid cash.

2. Mary receives an allowance of $3.60 a week. If she saves 16 2/3% of it this week, how much will she save? How much will she spend?

3. A suit was marked $250, but sold late in the season with a 20% discount. What was the amount of discount and the discount price?

4. A washing machine marked $475, sold with a discount of 10% because the enamel was cracked? Find the amount of discount and the discount price.

5. Out of every dollar she earns, Mrs. Davis spends 53¢ for food and shelter. What percent of each dollar remains for all other items?

6. Eight inches is what percent of a foot?

7. In a certain factory, 156 workers, or 12% of the total number of workers employed, were less than 30 years of age. What was the total number of workers?

8. During one day 2.9% of all the parts needed in a certain assembly line in a large factory were rejected because of defects. If 348 parts were rejected, what was the total number of parts inspected in the line?

9. In a class of 20 students the following marks are received on a test: 4 students, 86%; 8 students, 76%; 6 students, 64%; and 2 students, 96%. What is the class average?

10. How much interest will $3,000 earn in one year if the interest rate is 5%?

5-11-1 UNIT TEST: PERCENTS

I. Complete the following:

1. 60% = 60 = ._____
2. 16% = 15 = ._____
3. 5% = __/100 = ._____
4. __% = 3/100 = ._____
5. __% = __/100 = .25

II. Write the following as fractions with denominator of 100:

1. 30% = _____
2. 6% = _____
3. 2% = _____
4. 100% = _____
5. 180% = _____

III. Write the following as percents:

1. 25/100
2. 6/100
3. 66 2/3 /100
4. 160/100
5. 1/2 /100

IV. In the blank to the left of the fractions in Column I. Place the percent found in Collumn II that is equivalent to the given fraction.

I	II
1. ____% = 1/4	a. 62 1/2%
2. ____% = 3/4	b. 25%
3. ____% = 3/8	c. 75%
4. ____% = 5/8	d. 37 1/2%

5. ____% = 2/5

6. ____% = 1/3

7. ____% = 1/6

8. ____% = 5/6

9. ____% = 1/20

10. ____% = 1/16

11. ____% =

e. 20%

f. 40%

g. 33 1/3%

h. 8 1/3%

i. 83 1/3%

j. 6 1/4%

k. 16 2/3%

l. 66 2/3%

V. Change the following fractions to percents:

1. 1/20 = _____

2. 1/10 = _____

3. 3/4 = _____

4. 5/8 = _____

5. 9/10 = _____

6. 1/5 = _____

7. 5/25 = _____

8. 325/1000 = _____

9. 1/200 = _____

10. 1/3 = _____

VI. Change the following decimals to percents:

1. .50 = _____%

2. .25 = _____%

3. .06 = _____%

4. 1.07 = _____%

5. .005 = _____%

6. 2.5 = _____%

7. .15 = _____%

8. .01 = _____%

9. .032 = _____%

10. 1.10 = _____%

VII. Change the following percents to decimals:

1. 70% = _____%

2. 2% = _____%

3. 1% = _____%

4. 200% = _____%

5. 120% = _____%

6. 100% = _____%

VIII. Solve the following by changing the percent to a common fraction and multiplying:

1. 10% of $6.00 = _____, 2. 33 1/3% of $9,000 = _____,

3. 200% of $50 = _____.

IX. Solve the following problems by changing the percent to a decimal and multiplying:

1. 15% of 40 = _____

2. 5% of 250 = _____

3. 125% of 500 = _____

X. Solve the following problems.

1. A store is selling its furniture at a discount of 15% from the marked price. What will be the discount on a chair that was marked $40?

2. In a shipment of 25 cases of paint, 5 cases were rejected. What percent was rejected?

3. Mrs. Gair saved $576 from her annual income of $9,400. What percent did she save?

4. What percent was a stove reduced if it was marked $600 and sold for $525?

5. If a small appliance repairman's hourly rate is $4.80, and this is increased 16 2/3%, what is the new hourly rate?

INSTRUCTIONAL MATERIALS

5-0-0 Unit V: Percents

5-2-0 Concept of percents

5-2-2 Wollensak skilltape, #C-3151

5-2-3 Filmstrip - "Understanding Percents"

5-3-0 Changing Fractions to Percents

5-3-1 Transparencies

5-3-2 Wollensak skilltape, #C-3151

5-3-3 Study sheet

5-3-4 Activity sheet

5-3-5 Cyclo-Teacher

5-4-0 Changing Percents to Fractions

5-4-1 Wollensak skilltape, #C-3151

5-4-2 Activity sheet

5-4-3 Cyclo-Teacher

5-5-0 Changing Decimals to Percents

5-5-1 Overhead projector and transparencies

5-5-2 Wollensak skilltape, #C-3151

5-5-3 Activity sheet

5-5-4 Cyclo-Teacher

5-6-0 Changing Percents to Decimals

5-6-1 Overhead projector and transparencies

5-6-2 Wollensak skilltape, #C-3151

5-6-3 Activity sheet

5-6-4 Cyclo-Teacher

5-7-0 Finding the Percent of a Number

5-7-1 Overhead projector and transparencies

5-7-2 Wollensak skilltape, #C-3151

5-7-3 Activity sheet

5-7-4 Cyclo-Teacher

5-8-0 Finding the Percent of a Number

5-8-1 Overhead projector and transparencies

5-8-2 Wollensak skilltapes

5-8-3 Cyclo-Teacher

5-8-4 Activity sheet

5-9-0 Finding What Percent One Number is of Another

5-9-1 Overhead projector and transparencies

5-9-2 Activity sheet

5-10-0 Problem Solving in Housecare Services

5-11-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT VI
Units of Measure and Measurement
(Linear, Liquid, Dry, Weight, Time, Area, and Volume)

6-0-0 Upon completion of this topic the house care students will show a basic understanding of the units of measure and how measurement may be applied to house care services, as evidenced by scoring 70% or above on a teacher-made test.

6-1-0 The project teacher will use tape measures, rulers, measuring cups, and other measuring devices to teach the concept of linear, liquid, dry, weight, time, area, and volume measurement and the relatedness to house care services.

6-2-0 The project teacher will use lecture and chalkboard to teach changing a given number of linear units to units of smaller denomination and changing a given number of linear units to units of larger denominations.

6-2-1 Lecture and work examples of changing to a smaller unit of linear measurement and changing to a larger unit of measurement

6-2-2 Study Sheet: Tables of Measure

6-2-3 Activity: Changing From One Length to Another

6-3-0 The project teacher will use lecture and chalkboard to teach addition and subtraction of denominate numbers (Length).

6-3-1 Lecture using overhead projector

6-3-2 Activity: Addition and Subtraction of Denominate Numbers (Length)

6-4-0 The project teacher will lecture, using overhead projector and chalkboard to teach multiplication and division of denominate numbers (Length).

6-4-2 Activity: Multiplication and Division of Denominate Numbers (Length)

6-5-0 The project teacher will use lecture, overhead projector and chalkboard to teach changing from one unit of liquid measure to another unit of liquid measure.

6-5-1 Lecture and work examples of changing from one unit of liquid measure to another unit of liquid measure

6-5-2 Activity: Changing From One Unit of Liquid Measure to Another Unit of Liquid Measure

6-6-0 The project teacher will use lecture and chalkboard to teach addition and subtraction of denominate numbers (Liquid measure).

6-6-1 Lecture on addition and subtraction of denominate numbers (Liquid measure)

6-6-2 Activity: Addition and Subtraction of Denominate Numbers (Liquid measure)

6-7-0 The project teacher will use lecture and chalkboard to teach multiplication and division of denominate numbers (Liquid measure).

6-7-1 Lecture on multiplication and division of denominate numbers (Liquid measure)

6-7-2 Activity: Multiplication and Division of Denominate Numbers (Liquid measure)

6-8-0 The project teacher will lecture using measuring devices for dry measure, overhead projector, and chalkboard to teach changing units of dry measure to another unit of dry measure and the fundamental operations (addition, subtraction, multiplication, and division) with denominate numbers involving dry measure.

6-8-1 Lecture and work examples of the fundamental operations with denominate numbers (Dry measure)

6-8-2 Activity: Changing From Smaller and Larger Units of Dry Measure and Exercises Involving the Fundamental Operations with Denominate Numbers Involving Dry Measure

6-9-0 The project teacher will introduce the concept of weight and the fundamental operations of denominate numbers involving units of weight by using lecture, overhead projector, and devices used for measuring weight.

6-9-1 Lecture and work examples of changing from smaller to larger and from larger to smaller units of weight and show examples of the fundamental operations

6-9-2 Activity: Changing From One Unit of Weight to Another and the Fundamental Operations of Denominate Numbers Related to Weight

6-10-0 The project teacher will use prepared activity sheets, lecture, time measuring devices, and chalkboard to teach the concept of time and the fundamental operations of numbers involving time.

6-10-1 Lecture and discussion involving the concept of time and the fundamental operations involving denominate numbers related to time

6-10-2 Activity: Conversions, Addition, Subtraction, Multiplication, and Division Exercises Related to Time

6-11-0 The project teacher will use lecture, overhead projector, and measuring devices to teach the concepts of area and volume and their relatedness to house care services.

6-11-1 Lecture on area and volume

6-11-2 Activity: Conversions and the Fundamental Operations of Denominate Numbers Involving Area and Volume

6-12-0 The project teacher will use lecture and chalkboard to teach solving reading problems involving measure and measurement related to house care services.

6-12-1 Activity: Solving Reading Problems

6-13-0 The project teacher will administer a unit test.

6-13-1 Unit Test

6-2-2 Study Sheet: Tables of Measure

Measure of Length

1 foot (ft.)	=	12 inches (in.)
1 yard (yd.)	=	3 feet (ft.)
1 rod (rd.)	=	16 1/2 feet (ft.)
1 statute mile (stat. mi.)	=	5,280 feet (ft.)
	=	1,760 yards (yds.)
	=	320 rods (rds.)

Measure of Area

1 square foot (sq. ft.)	=	144 square inches (sq. in.)
1 square yard (sq. yd.)	=	9 square feet (sq. ft.)
1 square rod (sq. rd.)	=	30.25 square rods (sq. rds.)
1 acre	=	160 square rods (sq. rds.)
	=	4,840 square yards (sq. yds.)
	=	43,560 square feet (sq. ft.)
1 square mile (sq. mi.)	=	640 acres

Measure of Volume

1 cubic foot (cu. ft.)	=	1,728 cubic inches (cu. inc.)
1 cubic yard (cu. yd.)	=	27 cubic feet (cu. ft.)

Liquid Measure

1 pint (pt.)	=	16 ounces (oz.)
	=	4 gills (gi.)
1 quart (qt.)	=	2 pints (pt.)
1 gallon (gal.)	=	4 quarts (qt.)

Dry Measure

1 quart (qt.)	=	2 pints (pt.)
1 peck (pk.)	=	8 quarts (qt.)
1 bushel (bu.)	=	4 pecks (pks.)

Measure of Weight - Avoirdupois

1 pound (lb.)	=	16 ounces (oz.)
1 short ton (sh. tn., st., or T.)	=	2,000 pounds (lbs.)
1 long ton (l.t., or l. ton)	=	2,240 pounds (lbs.)

Cubic Measure

1,728 cubic inches (cu. in.) = 1 cubic foot (cu. ft.)
27 cubic feet = 1 cubic yard (cu. yd.)

Measure of Time

1 minute (min.)	=	60 seconds (sec.)
1 hour (hr.)	=	60 minutes (min.)
1 day (da.)	=	24 hours (hrs.)
1 week (wk.)	=	7 days (da.)
1 year (yr.)	=	12 months (mos.)
	=	52 weeks (wks.)
	=	365 days (da.)
	=	366 days (da.) leap year

6-2-3 Activity: Changing From One Length to Another

1. Find the number of inches in:

   (a) 3 ft., 18 ft., 6 2/3 ft., 3/4 ft.
   (b) 5 yds., 32 yds., 8 3/4 yds., 2 5/8 yds.
   (c) 2 ft. 6 in., 8 ft. 10 in., 2 yd. 9 in., 8 yd. 22 in.

2. Find the number of feet in:

   (a) 6 yds., 24 yds., 21 yds., 3/4 yd., 6 1/2 yds.
   (b) 6 mi., 20 mi., 5/8 mi., 10 1/2 mi., 10 1/4 mi.
   (c) 48 in., 144 in., 900 in., 468 in., 156 in.
   (d) 10 yd. 2 ft., 45 yd. 1 ft., 3 mi. 700 ft., 8 rd. 5 ft.

3. Find the number of yards in:

   (a) 2 mi., 28 mi., 1/4 mi., 1/2 mi.
   (b) 5 rd., 4 rd., 9 rd., 3/4 rd.
   (c) 27 ft., 9 ft., 42 ft., 96 ft.
   (d) 108 in., 504 in., 720 in., 648 in.

4. Find the number of rods in:

   (a) 5 mi., 12 mi., 7 3/4 mi., 7 1/2 mi.
   (b) 33 ft., 132 ft., 49 1/2 ft., 74 1/4 ft.
   (c) 25 yd., 125 yd., 121 yd., 16 1/2 yd.

5. Find the number of miles in:

   (a) 10,560 ft., 47,520 ft., 29,200 ft.
   (b) 640 rd. 2,770 rd. 8,000 rd.
   (c) 7,040 yd. 17,600 yd. 44,000 yd.

6. What part of a yard is:

   (a) 24 in. (b) 30 in. (c) 2 ft. (d) 1 ft.

7. What part of a foot is:

   (a) 6 in. (b) 3 in. (c) 5 in. (d) 10 in.

8. What part of a mile is:

   (a) 880 yds. (b) 1,320 ft. (c) 1,640 yds. (d) 80 rds.

6-3-2 Activity: Addition and Subtraction of Denominate Numbers

EXAMPLE: Add 15 yds. 2 ft. 9 in., 7 yds. 1 ft. 4 in., and 5 yds., 2 ft. 6 in.

Write the numbers so that numbers of the same denomination are in a column.

15 yds.	2 ft.	9 in.
7 yds.	1 ft.	4 in.
5 yds.	2 ft.	6 in.
29 yds.	0 ft.	7 in.
	2 yds.	1 ft.

The sum of the right column is 19 inches, which is 1 foot, 7 inches. Write the 7 inches in inches' column under the line and carry 1 foot to the next column, including the 1 foot carried is 6 feet, which equals 2 yards. The sum of the next column, including the 2 yards carried, is 29 yards. Therefore, the sum is 29 yds. and 7 in.

EXAMPLE: Subtract 3 miles 245 rods from 15 miles 160 rods.

15 mi. 160 rds.	=	14 mi. 480 rds.
3 mi. 245 rds.	=	3 mi. 245 rds.
		11 mi. 235 rds.

Hint: 1 mile = 320 rods

I. Add and simplify:

(1)
1 ft.	5 in.	
1 ft.	2 in.	

(2)
2 yd.	18 in.	
3 yd.	26 in.	

(3)
40 yd.	2 ft.	10 in.
10 yd.	1 ft.	6 in.
5 yd.		8 in.

(4)
8 yd.	2 ft.	3 in.
7 yd.	1 ft.	9 in.
10 yd.	0 ft.	2 in.
12 yd.	1 ft.	11 in.

(5)
1 mi.	40 rd.	1 ft.	10 in.
3 mi.	190 rd.	5 ft.	6 in.
5 mi.	220 rd.	10 ft.	8 in.

(6)
6 yd.	1 ft.	8 in.
4 yd.	3 ft.	11 in.
2 yd.	2 ft.	9 in.

(7)
45 rd.	4 yd.	2 ft.	7 in.
10 rd.	2 yd.	1 ft.	8 in.
22 rd.	4 yd.	2 ft.	9 in.
19 rd.	1 yd.	1 ft.	6 in.

(8)
7 ft.	5 in.
4	10
8	5

(9)
4 yd.	2 ft.	11 in.
8	1	7

(10) 8 ft. 5 in., 4 ft. 10 in., and 8 ft. 5 in.

(11) 11 ft. 3 in. and - ft. 10 in.

II. Subtract:

(1) 9 yd. 7 in.
5 yd. 2 in.

(2) 6 ft.
7 ft. 8 in.

(3) 8 ft. 4 in.
3 ft. 9 in.

(4) 11 ft. 3 in.
4 ft. 10 in.

(5) 6 mi. 2,000 ft.
5,000 ft.

(6) 20 rd. 12 ft. 10 in.
11 rd. 8 ft. 11 in.

(7) 6 mi. 240 rd.
5 mi. 300 rd.

(8) 9 mi. 1820 ft.
5 mi. 2000 ft.

(9) 5 mi. 120 rd. 8 yd. 26 in.
2 mi. 210 rd. 4 yd. 30 in.

(10) 8 yd.
2 yd. 1 ft. 7 in.

6-4-2 Activity: Multiplication and Division of Denominate Numbers (Length)

EXAMPLE: Multiply 4 yards 2 feet 11 inches by 4.

$$\begin{array}{r} 4 \text{ yd. } 2 \text{ ft. } 11 \text{ in.} \\ \times \quad\quad\quad\quad\quad 4 \\ \hline 19 \text{ yd. } 2 \text{ ft. } 8 \text{ in.} \end{array}$$

4 x 11 in. = 44 in. = 3 ft. 8 in. Write 8 in the inches column and carry the 3 ft. 4 x 2 ft. = 8 ft. + 3 ft. = 11 ft. 11 ft. = 3 yds. 2 ft. Write 2 in the feet column and carry the 3 yds. 4 x 4 yd. 3 yd. + 16 yd. = 19 yd. The product is 19 yd. 2 ft. 4 in.

To divide denominate numbers, we divide each unit by the divisor. If the unit is not exactly divisible, we change the remainder to the next smaller unit and combine with the number of the smaller unit to form the next partial dividend.

EXAMPLE 1: Divide 26 yards 2 feet 7 inches by 6.

$$\begin{array}{r} \quad\quad 6 \quad\quad 24 \\ 6\overline{)26 \text{ yd. } 2 \text{ ft. } 7 \text{ in.}} \\ 4 \text{ yd. } 1 \text{ ft. } 5\ 1/6 \text{ in.} \end{array}$$

26 yards ÷ 6 = 4 yards with a remainder of 2. Reduce 2 yards to feet (6 ft.) and add 2 ft. 8 ÷ 6 = 1 foot with a remainder of 2. Reduce 2 feet to 24 inches and add 7 inches. 31 ÷ 6 - 5 1/6.

EXAMPLE 2: Divide 9 yards 1 foot 10 inches by 8.

$$\begin{array}{r} \quad\quad 3 \quad\quad 48 \\ 8\overline{)9 \text{ yds. } 1 \text{ ft. } 10 \text{ in.}} \\ 1 \text{ yd. } 0 \text{ ft. } 7\ 1/4 \text{ in.} \end{array}$$

Since 8 is not contained in 4, reduce 4 feet to inches (48). The result is 1 yd. 7 1/4 in. (no feet).

EXAMPLE 3: Divide 3 yards 2 feet 4 inches by 5.

$$\begin{array}{r} \quad\quad 9 \quad\quad 12 \\ 5\overline{)3 \text{ yd. } 2 \text{ ft. } 4 \text{ in.}} \\ 2 \text{ ft. } 3\ 1/5 \text{ in.} \end{array}$$

First reduce 3 yards to feet and then proceed as above.

I. Multiply and simplify:

(1) $\underline{2 \text{ ft. } 4 \text{ in.}} \times 3$ (2) $\underline{2 \text{ mi. } 442 \text{ yd.}} \times 6$ (3) $\underline{10 \text{ yd. } 9 \text{ in.}} \times 4$

(4) 5 yd. 2 ft. 8 in. × 5

(5) 2 mi. 45 rd. × 12

(6) 20 rd. 8 ft. 10 in. × 8

(7) 3 ft. 7 in. × 4

(8) 7 ft. 8 in. × 9

(9) 3 yd. 2 ft. 1 in. × 5

(10) 7 yd. 2 ft. 4 in. × 2

II. Divide:

(1) 2)28 ft. 10 in.

(2) 4)12 ft. 7 in.

(3) 7)18 rd. 2 ft. 3 in.

(4) 4)125 mi. 40 rd. 12 ft. 6 in.

(5) 14)110 yd. 2 ft.

(6) 21)54 yd. 1 ft. 7 in.

(7) 4)12 mi. 220 yd.

(8) 3)7 ft. 9 in.

(9) 8)25 yd. 20 in.

(10) 5)8 yd. 2 ft. 3 in.

6-5-2 Activity: Changing From One Unit of Liquid Measure to Another

1. Find the number of ounces in:

   (a) 5 pts., 16 pts., 3 3/4 pts.
   (b) 2 gal., 5 gal., 1 3/4 gal.
   (c) 1 pt. 10 oz., 8 qts. 13 oz., 1 gal. 6 oz.
   (d) 3 qts., 20 qts., 5 1/4 qts.

2. Find the number of pints in:

   (a) 8 qts., 45 qts., 8 1/2 qts., 6 1/2 qts.
   (b) 3 gal., 8 gal., 6 1/2 gal.
   (c) 4 qts. 1 pt., 5 qts. 1 pt., 11 qts. 1 pt.
   (d) 32 oz., 224 oz.

3. Find the number of quarts in:

   (a) 2 gal., 16 gal., 8 1/2 gal.
   (b) 6 gal. 2 qts., 2 gal. 1 qt., 8 gal. 3 qts.
   (c) 6 pts., 34 pts., 8 pts., 25 pts.
   (d) 64 oz., 288 oz., 180 oz.

4. Find the number of gallons in:

   (a) 12 qts., 90 qts., 84 qts.
   (b) 32 pts., 16 pts., 40 pts.
   (c) 256 oz., 384 oz., 192 oz.

5. (a) What part of a pint is:
   6 oz.? 8 oz.? 12 oz.?

   (b) What part of a quart is:
   20 oz.? 16 oz.? 3/4 pt.?

   (c) What part of a gallon is:
   2 3/4 qts.? 64 oz.? 2 1/2 qts.?

6-6-2 Activity: Addition and Subtraction of Denominate Numbers (Liquid measure)

I. Add and simplify:

(1) 2 gal. 1 qt.
6 gal. 1 qt.

(2) 2 qts. 14 oz.
6 qts. 9 oz.

(3) 6 gal. 3 qts.
8 gal. 2 qts.
5 gal. 3 qts.

(4) 6 pts. 12 oz.
5 pts. 7 oz.
2 pts. 9 oz.

(5) 8 gal. 1 qt. 1 pt.
9 gal. 3 qts. 1 pt.
7 gal. 2 qts. 1 pt.

II. Subtract:

(1) 3 qts. 1 pt.
1 qt. 1 pt.

(2) 2 pt. 12 oz.
15 oz.

(3) 4 qts. 1 pt. 5 oz.
1 qt. 1 pt. 12 oz.

(4) 8 gal.
3 gal. 3 qts.

(5) 6 gal. 1 qt. 1 pt.
3 qts. 1 pt.

6-7-2 Activity: Multiplication and Division of Denominate Numbers (Liquid measure)

I. Multiply and simplify:

(1) 6 gal. 1 qt. × 3

(2) 3 qts. 6 oz. × 8

(3) 1 pt. 9 oz. × 6

(4) 5 gal. 3 qts. × 8

(5) 5 gal. 3 qts. × 5

II. Divide:

(1) 3)12 gal. 3 qts.

(2) 5)5 pts. 15 oz.

(3) 7)9 qts. 6 oz.

(4) 10)32 gal. 2 qts.

(5) 3)24 gal. 4 qts.

6-8-2 Activity: Changing From Smaller and Larger Units of Dry Measure and Fundamental Operations with Denominate Numbers Related to Dry Measure

I. Change each of the following as indicated:

(1) 7 bu. 13 qts. to pints
(2) 22 pk. 4 qt. to quarts
(3) 5 pk. to quarts
(4) 6 qts. to pints
(5) 4 qts. 1 pt. to pints
(6) 3 bu. 2 pk. to pecks
(7) 29 qts. to pecks
(8) 9 1/2 qts. to pints
(9) 20 pk. to bushels
(10) 64 qts. to bushels

II. Add and simplify:

(1) 3 bu. 2 pk.
6 bu. 1 pk.

(2) 4 pk. 3 qts.
5 pk. 3 qts.

(3) 5 bu. 2 pk.
1 bu. 3 pk.
2 bu. 3 pk.

(4) 8 bu. 3 pk.
3 bu. 2 pk.
7 bu. 1 pk.

(5) 3 pk. 4 qts.
7 pk. 2 qts.
2 pk. 3 qts.

III. Subtract:

(1) 8 pk. 7 qts.
2 pk. 3 qts.

(2) 9 bu.
3 bu. 2 pk.

(3) 2 pk. 6 qts.
7 qts.

(4) 8 bu. 3 qts.
6 bu. 3 qts. 1 pt.

(5) 10 bu. 2 pk.
5 bu. 3 pk.

IV. Multiply and simplify:

(1) 2 pk. 3 qts.
2

(2) 5 bu. 1 pk.
3

(3) 2 pk. 7 qts.
6

(4) Multiply 8 bushels 3 pecks 2 quarts 1 pint by 16.

(5) Multiply 8 bushels 2 pecks by 7.

V. Divide:

(1) $2\overline{)14 \text{ pk. } 6 \text{ qts.}}$ ( ) $3\overline{)18 \text{ bu. } 3 \text{ pk.}}$ (3) $6\overline{)20 \text{ pk. } 2 \text{ qts.}}$

(4) Divide 180 bushels 3 pecks 6 quarts by 16.

(5) Divide 18 bushels 3 pecks by 5.

6-9-2 Activity: Changing From One Unit of Weight to Another and the Fundamental Operations of Denominate Numbers Related to Weight

I. Change each of the following as indicated:

(1) 3 lbs. 7 oz. to ounces
(2) 18 lbs. to ounces
(3) 9 lbs. 10 oz. to ounces
(4) 8,000 lbs. to short tons
(5) 20,000 lbs. to short tons
(6) 4,480 lbs. to long tons
(7) 2,000 lbs. to long tons
(8) 272 oz. to pounds
(9) 400 oz. to pounds
(10) 7 long tons 300 lbs. to pounds

II. Add and simplify:

(1) 9 lbs. 10 oz.
7 lbs. 13 oz.
4 lbs. 14 oz.

(2) 3 lbs. 4 oz.
6 lbs. 8 oz.

(3) 5 s.t. 1,600 lbs.
3 s.t. 1,000 lbs.

(4) 6 lbs. 9 oz.
8 lbs. 10 oz.
3 lbs. 13 oz.

(5) 2 l.t. 800 lbs.
6 l.t. 1,500 lbs.
2 l.t. 750 lbs.

III. Subtract:

(1) 6 lbs. 11 oz.
3 lbs. 6 oz.

(2) 9 lbs. 3 oz.
7 lbs. 15 oz.

(3) 4 s.t. 500 lbs.
2 s.t. 1,600 lbs.

(4) 6 lbs.
2 lbs. 8 oz.

(5) 8 lbs.
3 lbs. 12 oz.

IV. Multiply and simplify:

(1) 5 lbs. 3 oz.
6

(2) 5 s.t. 200 lbs.
10

(3) 2 lbs. 8 oz.
5

(4) 6 lbs. 12 oz.
8

(5) 3 s.t. 200 lbs.
12

V. Divide:

(1) 5)25 lbs. 5 oz.

(2) 9)27 l.t. 1,800 lbs.

(3) 7)10 lbs. 10 oz.

(4) 12)5 lbs. 4 oz.

(5) 3)15 lbs. 6 oz.

6-10-2 Activity: Conversions, Addition, Subtraction, Multiplication, and Division Exercises Related to Time

I. Change each of the following as indicated:

(1) 3 hrs. 27 min. to minutes
(2) 204 min. to hours and minutes
(3) 45 hrs. 21 min. 24 sec. to seconds
(4) 18 min. to seconds
(5) 12 min. 48 sec. to seconds
(6) 4 hrs. to minutes
(7) 3,600 sec. to minutes
(8) 10 5/6 hrs. to minutes
(9) 2 1/2 hrs. to minutes
(10) 2/3 hr. to seconds

II. Find the number of:

(1) days in 5 wks.; 1 3/4 yr.
(2) months in 8 yrs.; 7 yrs. 6 mos.
(3) weeks in 2 yrs.; 1 3/4 yr.
(4) years in 156 wks.; 1,461 da.

III. Add and simplify:

(1)
49 hrs. 30 min.
8 hrs. 39 min.

(2)
6 wks. 6 mos.
8 mos.

(3)
5 yrs. 6 mos.
9 yrs. 3 mos.
1 yr. 5 mos.

(4)
6 hrs. 25 min. 40 sec.
2 hrs. 17 min. 59 sec.
7 hrs. 38 min. 47 sec.

(5)
11 da.
20 da.
45 da.
18 da.

IV. Subtract:

(1)
10 mos.
7 mos.

(2)
14 hrs.
3 hrs.

(3)
6 da. 18 hrs.
4 da. 5 hrs.

(4)
10 min.
3 min. 36 sec.

(5)
9 hrs. 18 min. 15 sec.
1 hr. 30 min. 42 sec.

V. Multiply and simplify:

(1) 6 yrs. 3 mos. × 4

(2) 5 da. 3 hrs. × 9

(3) 2 hrs. 12 min. × 10

(4) 1 hr. 37 min. 7 sec. × 15

(5) 3 da. 2 hrs. × 15

VI. Divide:

(1) 2)10 yrs. 8 mos.

(2) 3)15 yrs. 9 mos.

(3) 4)18 hrs. 32 min.

(4) 6)9 da. 15 hrs.

(5) 15)7 hrs. 41 min. 30 sec.

6-11-2 Activity: Conversions and the Fundamental Operations of Denominate Numbers Involving Area and Volume

I. Change each of the following as indicated:

(1) 17 sq. ft. to square inches
(2) 15 1/4 sq. ft. to square inches
(3) 176 sq. ft. to square yards and square feet
(4) 320 cu. ft. to cubic yards and cubic feet
(5) 30 cu. yd. to cubic feet
(6) 15,552 cu. in. to cubic feet
(7) 189 cu. ft. to cubic yards
(8) 23 cu. yd. to cubic inches
(9) 50 acres to square rods
(10) 29 sq. rd. to square yards

II. Add and simplify:

(1) 10 A. 120 sq. rd.
5 A. 80 sq. rd.

(2) 2 sq. ft. 100 sq. in.
6 sq. ft. 72 sq. in.

(3) 8 sq. ft. 100 sq. in.
60 sq. ft. 60 sq. in.

(4) 30 sq. yd. 8 sq. ft. 100 sq. in.
5 sq. yd. 6 sq. ft. 72 sq. in.

III. Subtract:

(1) 2/3 acre
100 sq. rd.

(2) 2/3 acre
80 sq. rd. 30 sq. yd. 6 sq. ft. 100 sq. in.

(3) 5/6 sq. mi.
20 acre 100 sq. rd.

(4) 2/3 sq. rd.
1/2 sq. yd.

IV. Multiply and simplify:

(1) 7 square yards 4 square feet by 8
(2) 10 square rods 6 square feet by 16
(3) 16 square rods 10 square yards 6 square feet 14 square inches by 20

V. Divide:

(1) 10 square yards 5 square feet 120 square inches by 8
(2) 12 acres 140 square rods 20 square yards by 9

6-12-1 Activity: Solving Reading Problems

1. An 8' 6" board is to be divided into 3 equal shelves. How long will each shelf be?

2. Mary bought three remnants of ribbon at the following lengths: 4 yds. 9 in.; 2 yds. 24 in.; and 3 yds. 30 in. How much ribbon did she buy?

3. Ralph worked 5 days after school for 3 hrs. 45 min. each day, and on Saturday he worked 8 hrs. 30 min. How many hours did he work during the week?

4. How long should curtain material be cut for a window 5 feet 8 inches long if the curtain is to hang 6 inches below the sill and is to have a 3 in. hem at the top and a 2 1/2 in. hem at the bottom? Allow 1/2 in. for each turn-in.

5. A living room is 22 feet 8 inches long and 14 feet 10 inches wide. How many feet of picture molding are needed to go around the room just below the ceiling?

6. At 35¢ a square foot, what will it cost to lay a cement walk 5 ft. wide around the outside of a rectangular flower pot 45 ft. long and 30 ft. wide?

7. At $4.75 a gallon, what will be the cost of paint for the four exterior walls of a warehouse 42 ft. long, 30 ft. wide, and 16 1/2 ft. high if the first coat is estimated to require one gallon to 48 squ. yd. and the second coat one gallon to 72 sq. yd.?

8. How many half-pint bottles of cleaning fluid can be filled from a 5 gallon can of cleaning fluid?

9. Mrs. Jackson wishes to have three shelves built into her kitchen cupboard. If each shelf is to be 3 ft. 10 in. long, what is the total length needed for the job?

10. How much carpet is required to cover a floor 25 ft. wide by 36 ft. long?

6-13-1 UNIT TEST: UNITS OF MEASURE AND MEASUREMENT

I. Change each of the following as indicated:

(1) 1 yd. 2 ft. to inches
(2) 2 bu. to pecks
(3) 4 hrs. 20 min. to minutes
(4) 6 pts. to quarts
(5) 48 oz. to pounds
(6) 8 in. to feet
(7) 2 mi. to rods
(8) 3 qts. to pints
(9) 1,280 acres to square miles
(10) 5 qts. to pints
(11) 2 1/2 gal. to quarts
(12) 72 sq. in. to square feet
(13) 2,640 ft. to miles
(14) 1/4 sq. ft. to square inches
(15) 80 sec. to minutes
(16) 67 da. to weeks and days
(17) 3 1/3 cu. yds. to cubic feet
(18) 27 pk. to bushels
(19) 36 oz. to pounds
(20) 45 in. to feet

II. Add and simplify:

(1) 6 hrs. 45 min.
4 hrs. 36 min.

(2) 10 lbs. 11 oz.
3 lbs. 12 oz.

(3) 4 yds. 2 ft. 9 in.
4 yds. 1 ft. 9 in.

(4) 16 T. 1400 lbs.
7 T. 700 lbs.

III. Subtract:

(1) 13 bu. 3 pk.
10 bu. 1 pk.

(2) 14 yds. 2 ft. 8 in.
7 yds. 1 ft. 10 in.

(3) 8 yds. 2 ft.
2 yds. 1 ft.

(4) 9 ft. 7 in.
2 ft. 9 in.

IV. Multiply and simplify:

(1) 5 T. 280 lbs. × 8

(2) 12 gal. 3 qts. × 7

(3) 2 ft. 7 in. × 5

(4) 8 hrs. 16 min. × 6

V. Divide:

(1) 5 hrs. 24 min. by 4
(2) 16 yds. 1 ft. 3 in. by 3
(3) 11 lbs. 4 oz. by 5
(4) 3 qt. 1 pt. by 2

INSTRUCTIONAL MATERIALS

6-0-0 Unit VI: Units of Measure and Measurement

6-1-0 Tape measure, rulers, measuring cups, and other measuring devices

6-2-2 Study sheet: Tables of Measure

6-3-2 Activity sheet

6-4-0 Overhead projector and transparencies

6-4-2 Activity sheet

6-5-2 Activity sheet

6-6-0 Overhead projector and transparencies

6-6-2 Activity sheet

6-7-2 Activity sheet

6-8-2 Activity sheet

6-9-2 Activity sheet

6-10-2 Activity sheet

6-11-2 Activity sheet

6-12-1 Activity sheet

6-13-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes ____ No ____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT VII
Metric System

7-0-0 Upon completion of this topic the house care students will show a basic knowledge in metric measurements related to house care services by scoring 70% or above on a teacher-made test.

7-1-0 The project teacher will use cassette player, filmstrip - "Metric System", and a metric scale to familiarize the students with linear measurements.

7-1-1 Use metric ruler to show units of measure in the metric system.

7-1-2 Measure several items using the metric ruler.

7-1-3 Activity: Metric Linear Measurement

7-2-0 The project teacher will use a metric scale and teacher-made charts to show comparison of metric units of measure.

7-2-1 Lecture

7-2-2 Use metric scale to add several small units to obtain a larger unit.

7-2-3 Activity: Comparison of Metric Units

7-3-0 The project teacher will use lecture and transparencies to teach basic concepts of liquid measurement.

7-3-1 Lecture

7-3-2 Activity: Metric Liquid and Capacity Measurements

7-4-0 The project teacher will use lecture, metric weights, and scales to teach the concepts of measures of weight in the metric system.

7-4-1 Lecture

7-4-2 Activity: Measurement of Weight in the Metric System

7-5-0 The project teacher will use a teacher-made table to teach the concept of area and volume using the metric system.

7-5-1 Lecture

7-5-2 Activity: Area and Volume Using the Metric System

7-6-0 The project teacher will use the meter stick, the yard stick, and a metric conversion table to compare the English and metric systems.

7-6-1 A Handy Metric Conversion Table

7-6-2 Lecture on converting English and metric linear measurement.

7-6-3 Activity: Comparing English and Metric Linear Systems

7-6-4 Lecture on converting English and metric liquid measurement.

7-6-5 Activity: Converting Metric and English Units of Liquid and Capacity Measurements

7-6-6 Lecture on converting the English and metric units of weight.

7-6-7 Activity: Converting the Metric and English Units of Weight

7-6-8 Lecture on converting the English and metric systems of volume and area.

7-6-9 Activity: Converting Square and Cubic Measurement in the English System and the Metric System

7-7-0 The project teacher will administer a teacher-made test.

7-7-1 Unit Test

7-1-3 Activity: Metric Linear Measurement

I. Write the metric measure of length for each of the following abbreviations:

(a) dm (b) mm (c) cm (d) m (e) hm (f) dkm (g) km

II. Using a metric ruler, determine the following:

(a) How many millimeters are in one centimeter?

(b) How many centimeters are in one decimeter?

(c) How many millimeters are in one decimeter?

(d) How many decimeters are in one meter?

III. Write the numeral signified by the prefix:

(a) milli (m) (b) centi (c) (c) deci (d) (d) deca (dc)

(e) hecto (h) (f) kilo (k) (g) mega

IV. Draw five lines on your paper. Using a centimeter scale, mark off, in succession on these lines, segments of the following lengths:

3 cm; 5 cm; 8 cm; 11 cm; 14 cm

V. Using a centimeter scale, draw line segments of the following lengths:

31 mm; 4.6 cm; 11.7 cm

7-2-3 Activity: Comparison of Metric Units

1. Study the following example and complete the chart below.

Example:

km	hm	dcm	m	dm	cm	mm
5	50	500	5,000	50,000	500,000	5,000,000

km	hm	dcm	m	dm	cm	mm
1						
			15			
						500
				1,000		
		250				
	35					
25						
					2,000	
						15,000,000
			2,560			
					3,656	

2. Complete the following:

(a) 1 dm = _____ mm

(b) 1 cm = _____ mm

(c) 1 dm = _____ cm

(d) 1 mm = _____ cm

(e) 1 dm = _____ m

(f) 1 cm = _____ m

(g) 1 mm = _____ m

(h) 1 mm = _____ dm

7-3-2 Activity: Metric Liquid Measurement

1. The liter is the basic unit of liquid measure in the metric system and the same prefixes are used as in linear measurements.

Example:

kl	hl	dcl	l	dl	d	ml
5	50	500	5,000	50,000	500,000	5,000,000

Use the example above to complete the following chart:

kl	hl	dcl	l	dl	d	ml
			1			
5						
					500	
	3					
						2,000
				25		
3.5						

2. Change:

(a) 5 d to ml (b) 21 liters to dl (c) 40 ml to d

(d) 4,305 liters to hl

3. Add and simplify:

(a) 5 kl 9 l + 7 kl 16 l (b) 12 d 5 ml + 4 d 8 ml

4. Subtract:

(a) 8 l 6 d - 1 l 4 d (b) 3 kl - 71

5. Multiply and simplify:

(a) $\frac{7 \text{ l } 3 \text{ dl}}{2}$ (b) $\frac{2 \text{ kl } 50 \text{ l } 8 \text{ d}}{25}$

6. Divide:

(a) $6\overline{)18 \text{ kl } 42 \text{ l}}$ (b) $3\overline{)1 \text{ dl } 9 \text{ d } 2 \text{ ml}}$

7. Alice mixed 79 d of warm water with 68 d of cold water. How many liters of water did she mix?

8. If a tank holds 1.5 kiloliters of water, how long will it take to fill it up if water flows in at the rate of 25 liters per minute?

9. Liquid measurements in the metric system may be thought of as units of capacity.

A cube with edges 1 de imeter in length is called a cubic decimeter (cu. dm).

One cubic decimeter is equal to 1000 cubic centimeters (cc). One cubic decimeter or 1000 cubic centimeters is equal to one liter.

The chart for capacity in the metric system is similar to the liquid measurements.

Example: 1000 cu. mm = 1 cu. cm
1000 cu. cm = 1 cu. dm
1 cu. dm = 1 liter
1 cu. cm = 1 milliliter

Complete the following chart:

CAPACITY

cu. m	cu. dm	cu. cm	cu. mm
1			
	250		
		500	
			5,200
		650	
	3,750		
5.5			

10. Express each of the following as liters:

(a) 1 cu. dm = _____ l

(b) 1000 cu. cm = _____ l

(c) 50,000 cu. mm = _____ l

11. If 1 quart equals .95 liters, change the following quarts to liters:

(a) 2 qts. = _____ l (c) 32 qts. = _____ l

(b) 10 qts. = _____ l (d) 500 qts. = _____ l

12. Change the following liters to quarts:

(a) 3 l = _____ qts. (d) 4.5 l = _____ qts.

(b) 8 l = _____ qts. (e) .5 l = _____ qts.

(c) 50 l = _____ qts

7-4-2 Activity: Measurement of Weight in the Metric System

I. What unit of metric measure of weight does each of the following abbreviations represent?

(1) dg (2) cg (3) mg (4) kg (5) dkg (6) hg (7) g

II. Complete each of the following:

(1) _____ g = 1 dkg

(2) _____ dkg = 1 kg

(3) _____ kg = 1 hg

(4) _____ mg = 1 cg

(5) _____ mg = 1 g

(6) _____ mg = 1 kg

(7) _____ cg = 1 kg

(8) 1 kg = _____ g = _____ mg

(9) _____ g = 1 cg

(10) 1 mg = _____ g _____ kg

III. Change:

(1) 6 cg to mg

(2) 8.25 dg to cg

(3) 80 hg to grams

(4) 33 cg to dg

(5) 4.6 dg to grams

(6) 67 kg to hg

(7) 389 cg to grams

(8) 4,009 mg to kg

(9) 8,107 mg to grams

(10) 5 mg to cg

IV. Add and simplify:

(1)
19 kg, 24 g
32 kg, 7 g

(2)
2 g, 9 cg, 8 mg
1 g, 8 cg, 7 mg
3 g, 4 cg, 9 mg

V. Subtract:

(1)
8 cg, 7 mg
2 cg, 3 mg

(2)
3 g, 8 cg, 1 mg
1 g, 9 cg, 5 mg

VI. Multiply and simplify:

(1)
5 kg, 8 g
× 3

(2)
2 g, 4 dg, 6 cg, 5 mg
× 5

VII. Divide:

(1) 2 16 g, 6 dg

(2) 15 2g, 4 cg, 3 mg

VIII. How many 25 mg tablets will be equivalent to a dose of 1 gram?

7-5-2 Activity: Area and Volume Using the Metric System

I. 100 square millimeters (mm^2) = 1 square centimeter (cm^2)
100 square decimeters (dm^2) = 1 square meter (m^2)
100 square meters (m^2) = 1 square dekametere (dkm^2)
100 square dekameters (dkm^2) = 1 square hectometer (hm^2)
100 square hectometers (hm^2) = 1 square kilometer (km^2)

To convert from one metric unit of square measure to another metric measure, we follow the same procedures as the English system.

(1) How many square centimeters are in 1 square meter?

(2) How many square meters are in 1 square kilometer?

(3) How many square millimeters are in 1 square meter?

(4) Change:

(a) 6 cm^2 to mm^2

(b) 44 dm^2 to cm^2

(c) 6.5 m^2 to cm^2

(e) 1.08 m^2 to mm^2

(f) .319 km^2 to m^2

(g) 624,000 mm^2 to m^2

II. 1,000 cubic millimeters (mm^3) = 1 cubic centimeter (cm^3)
1,000 cubic centimeters (cm^3) = 1 cubic decimeter (dm^3)
1,000 cubic decimeters (dm^3) = 1 cubic meter (m^3)
1 liter = 1 cubic decimeter (dm^3) = 1,000 cubic centimeters (cm^3 or c.c)
1 milliliter (ml) = 1 cubic centimeter (cm^3)
1 liter of water weighs 1 kilogram (kg)
1 milliliter (ml) or cubic centimeter (cm^3) of water weighs 1 gram (g)

(1) Change:

(a) 5 cm^3 to mm^3

(b) 3.49 dm^3 to cm^3

(c) 19.5 m^3 to mm^3

(e) 4,631 mm^3 to cm^3

(f) 78.3 cm^3 to dm^3

(g) 8,300,000 mm^3 to m^3

(2) How many liters of water are in a container if the water weighs 9 kilograms?

(3) How many milliliters of water are in a container if the water weighs 87 grams?

(4) A space of 340 cubic centimeters will hold how many milliliters of liquid?

(5) How many liters of water are in a container if the water weighs 9 kilograms?

7-6-1 Metric Conversion Table

	TO CHANGE	TO	MULTIPLY BY
1.	Millimeters	Liters	0.04
2.	Centimeters	Inches	0.4
3.	Meters	Feet	3.3
4.	Meters	Yards	1.1
5.	Inches	Centimeters	2.5
6.	Feet	Centimeters	3.0
7.	Yards	Meters	0.9
8.	Square Centimeters	Square Inches	0.16
9.	Square Meters	Square Yards	1.2
10.	Square Kilometers	Square Miles	0.4
11.	Square Inches	Square Centimeters	6.5
12.	Square Feet	Square Meters	0.09
13.	Square Yards	Square Meters	0.8
14.	Grams	Ounces	0.035
15.	Kilograms	Pounds	2.2
16.	Ounces	Grams	28
17.	Pounds	Kilograms	0.45
18.	Milliliters	Fluid Ounces	0.03
19.	Liters	Pints	2.1
20.	Liters	Quarts	1.06
21.	Liters	Gallons	0.26
22.	Cubic Meters	Cubic Feet	35
23.	Cubic Meters	Cubic Yards	1.3
24.	Teaspoon	Milliliter	5

	TO CHANGE	TO	MULTIPLY BY
25.	Tablespoons	Milliliters	15
26.	Fluid Ounces	Milliliters	30
27.	Cups	Liters	0.24
28.	Pints	Liters	0.47
29.	Quarts	Liters	0.95
30.	Gallons	Liters	3.8
31.	Cubic Feet	Cubic Meters	0.03
32.	Cubic Yards	Cubic Meters	0.76

7-6-3 Activity: Comparing Metric and English Linear Measurement

1. (a) Use your English ruler to measure and record the lengths of the following segments; (b) convert the English measurements to metric readings; and (c) check the conversions by using your metric ruler to measure the same segments.

(a) _____ (b) _____

(c) _____ (d) _____

(e) _____ (f) _____

(g) _____ (h) _____

(i) _____ (j) _____

(k) _____

(l) _____

2. Using the metric conversion table, convert the following to the indicated unit.

(a) 3 1/4 in. = _____ cm (d) 2.6 cm = _____ in.

(b) 1 3/8 in. = _____ cm (e) 1 m = _____ yds.

(c) 4 cm is = _____ in.

3. Change to inches:

(a) 42 cm (b) 9.75 m (c) 16 m (d) 25 cm

4. Change to feet:

(a) 7 m (b) 316 m (c) 680 cm (d) 2 m

5. Change to yards:

(a) 49 m (b) 600 m (c) 530 cm (d) 20 m

6. How many inches wide is a film 8 mm wide?

7. The height of mercury in a barometer is 761.32 cm. Express this height in inches.

8. Express your height using metric units.

7-6-5 Activity: Converting the Metric and English Units of Liquid and Capacity Measurements

1. Determine each of the following:

   (a) 1 liquid pint = _____ liter(s)

   (b) 8 fluid ounces = _____ ml

   (c) 1 liquid pint = _____ ml

   (d) 1 gallon = _____ liters

   (e) 1 fluid ounce = _____ ml

2. A bottle has a capacity of 8 qts.

   (a) How many liters does it contain?

   (b) How many cubic centimeters?

3. An automobile gasoline tank having a capacity of 16 gal. will hold how many liters?

   Some labels on canned and bottled goods state the capacity of the contents both in metric and English measures. Check the accuracy of each of the following:

4. A can of apple juice, 1 liquid quart or 946 ml

5. A bottle of spot remover, 16 fluid ounces or 473 c.c

6. A jar of pickles, 1 pint, 10 fluid ounces or .77 liters

7. A jar of liquid wax, 1 quart, 14 fluid ounces or 1.36 liters

8. A can of tomato juice, 12 fluid ounces or .356 liters

9. A tank holds 600 liters of water. How many gallons does it hold?

7-6-7 Activity: Converting the Metric and English Units of Weight

Some labels on canned and bottled goods state the weight of the contents both in metric and English measures. Check the accuracy in each of the following:

1. A can of wax weighing 1 lb. 13 oz. or 822 g

2. A can of corn weighing 1 lb. 1 oz. or 482 g

3. A bottle of spot remover weighing 1 lb. 4 oz. or 567 g

4. How many pounds does a 10 kg bag of apples weigh?

5. A dealer ordered 4,800 kg of merchandise. How many tons is this?

6. A lady weighs 164 lbs. Express this weight in kilograms.

7. Turpentine weighs .87 as much as an equal volume of water.

   (a) What is the weight in pounds of 5 l of turpentine?

   (b) What is the weight in grams of 2 qts. of turpentine?

8. Express 12 lbs 4 oz.

   (a) as grams (b) as kilograms

9. What is the price of 1/2 kg of butter at 48¢ per pound?

10. Express your weight in pounds as kilograms.

7-6-9 Activity: Converting Square and Cubic Measurement in English and Metric Units of Measures

1. What is the area in square meters of a plot 40 ft. by 120 ft.?

2. What is the floor space of a room 6 meters by 9 meters expressed in square feet?

3. Find the area in square inches of a poster 44 cm by 80 cm.

4. How many square yards are in a lawn 24.6 m by 32.4 m?

Change: (round answer to nearest hundredth)

5. 64 cm^3 to cu. in.

6. 143.9 m^3 to cu. ft.

7. 300 cu. yds. to m^3

8. 180 cu. in. to cm^3

9. 59 cu. ft. to m^3

10. 8 m^3 to cu. yds.

7-7-1 UNIT TEST: METRIC SYSTEM

I. Complete the following charts on metric measurements.

(a)

km	dcm	hm	m	dm	cm	mm
			250			
		62.5				
						25,000,000
				4,226		
18.4						
					74,560	
	81.5					

(b)

kl	dcl	hl	l	dl	cl	ml
22.6						
			2,510			
						185,600
	215					
		555				
					75,000	
				627.2		

(c)

cu. m	cu. dm	cu. cm	cu. mm
.5			
	25		
			92,150
		45,627.5	
.03			

II. Solve the following problems:

(a) 1 m = _____ cm

(b) 15 dm = _____ cm

(c) 5 km = _____ m

(d) 10 dcm = _____ cm

(e) 500 mm = _____ cm

(f) 1 mi. = _____ mm

(g) 1 ft. = _____ cm

(h) 1 yd. = _____ m

(i) 12 ft. = _____ m

(j) 6 in. = _____ cm

(a) 1 l = _____ d

(b) 6 l = _____ ml

(c) 5 dl = _____ ml

(d) 1 dcl = _____ l

(e) 15 d = _____ dl

(f) 1 qt. = _____ l

(g) 5 pts. = _____ l

(h) 150 ml = _____ pts.

(i) 1000 d = _____ ml

(j) 500 ml = _____ l

III.

(a) An object that weighs 1 kg weighs how many pounds?

(b) A French girl is 1.6 m tall. Express her height in feet.

(c) A building lot is 25 ft. x 100 ft. Express these dimensions in meters.

(d) Using formula A = lw; find the area:

l = 37 cm, w = 26 cm A = _____

(e) Using formula V = lwh; find the volume:

l = 27 cm, w = 18 cm, h = 13 cm V = _____

(f) A man is 5' 9" tall. Express his height in centimeters.

INSTRUCTIONAL MATERIALS

7-0-0 Unit VII: Metric System

7-1-0 Cassette player, filmstrip, metric scale

7-1-1 Metric ruler

7-1-2 Metric ruler

7-1-3 Activity sheet

7-2-0 Metric scale, teacher-made charts

7-2-2 Metric scale

7-2-3 Activity sheet

7-3-0 Transparencies

7-3-2 Activity sheet

7-4-0 Metric weights, scales

7-4-2 Activity sheet

7-5-0 Teacher-made table

7-5-2 Activity sheet

7-6-0 Meter stick, yard stick, metric conversion table

7-6-1 Metric conversion table

7-6-3 Activity sheet

7-6-5 Activity sheet

7-6-7 Activity sheet

7-6-9 Activity sheet

7-7-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT VIII
Ratio and Proportion

8-0-0 At the end of this unit the house care students will be able to solve ratio and proportion, as shown, by scoring 70% or above on a teacher-made test.

8-1-0 The project teacher will use a filmstrip, "Ratio and Proportion", and chalkboard to teach ratio as comparison of numbers by division.

8-1-1 Lecture and discussion of ratio

8-1-2 Activity: Ratios

8-2-0 The project teacher will use denominate numbers to reinforce understanding of ratios by use of overhead projector.

8-2-1 Lecture using overhead projector

8-2-2 Activity: Ratios Using Denominate Numbers

8-3-0 The project teacher will use chalkboard and study sheet to teach the properties of a proportion.

8-3-1 Study Sheet: Properties of a Proportion

8-3-2 Activity: Solving Proportions

8-4-0 The project teacher will use practical problems related to house care services to apply knowledge of ratio and proportion.

8-4-1 Lecture on how to solve problems involving proportions

8-4-2 Activity: Solving Verbal Problems Involving Ratio and Proportion

8-5-0 The project teacher will use teacher-made test to evaluate the progress of the students.

8-5-1 Unit Test

8-1-2 Activity: Ratios

1. Write the following as ratios in lowest terms.

   (a) 4 12 (b) 8 10 (c) 3 5 (d) 6 9

   (e) 3 5 (f) 10 12 (g) 2 6 (h) 4 8

2. The ratio of 15 to 5 is the same as _____ to 1.

3. The ratio of 21 to 3 is the same as _____ to 1.

4. The ratio of 8 to 6 is the same as _____ to 3.

5. The ratio of 12 to 10 is the same as _____ to 5.

6. The ratio of 3 to 5 is the same as _____ to 100.

7. The ratio of 15 to 20 is the same as _____ to 100.

8. Arrange the following ratios in order of size from the smallest to the largest: 4:5, 3:4, 8:7, and 1:1

9. A recipe for ice cream calls for 3/4 cup of sugar and 2 cups of cream. What is the ratio of cream to sugar in the recipe?

10. Mary earns $12. per day and saves $5. of it. Find the ratio of her week's savings to her earnings (5 days per week).

8-2-2 Activity: Ratios Using Denominate Numbers

Numbers that are to be ompared must be expressed in the same unit of measure. The ratio of 20 minutes to 1 hour is not 20 to 1; it is 20 to 60 (since 1 hr. = 60 min.), or 1 to 3. The ratio of 9 in. to 1 ft. is not 9 to 1. First, you must change 1 ft. to 12 in. The ratio is 9 to 12 or 9/12. Reduce to 3:4 or 3/4.

Express each of the following ratios as a common fraction reduced to lowest terms.

1. 3 in. to 2 ft.
2. 1 yd. to 27 in.
3. 8 in. to 1 ft.
4. 10 lbs. to 35 lbs.
5. 20 min. to 45 min.
6. 3 days to 2 wks.
7. 2 in. to 1 yd.
8. 30 in. to 1 yd.
9. 2 qts. to 1 gal.
10. 8 mo. to 2 yrs.
11. 5 ft. to 2 yds.
12. 50¢ to $3.
13. 1 gal. to 1 pt.
14. 2 ft. to 8 in.
15. 4 yds. to 2 ft.
16. $2. to 75¢
17. 1 1/2 ft. to 8 in.
18. 1 1/4 hr. to 45 min.
19. 1 1/2 hr. to 1 wk.
20. 3 min. to 20 sec.
21. a dollar to a dime
22. 6 mo. to 3 yrs.
23. 2 oz. to 1 1/2 lb.
24. 10 min. to 2 1/6 hrs.
25. 1 1/2 hr. to 1 week
26. 2 bu. to 2 pk.
27. 2 nickels to a quarter
28. 3 gal. to 2 qts.
29. 3 lbs. to 12 oz.
30. a dozen things to 10 things

8-3-1 Study Sheet: Special Properties of a Proportion

1. Means - Extremes Product Property of a Proportion

   If $a/b = c/d$, then $ad = bc$

   Ex. $3/6 = 4/8$, so $3 \times 8 = 4 \times 6$

2. Equivalent - Form Property of a Proportion

   $a/b = c/d$, $a/c = b/d$, $b/a = d/c$, $c/a = d/b$ are equivalent

   Ex. $3/6 = 4/8$, $3/4 = 6/8$, $6/3 = 8/4$, $4/3 = 8/6$

   (all are true if any one is true, provided no letter represents zero)

3. Denominator - Addition Property of a Proportion

   If $a/b = c/d$, then $a+b/b = c+d/d$

   Ex. $3/6 = 4/8$, then $3+6/6 = 4+8/8$, $9/6 = 12/8$

4. Denominator - Subtraction Property of a Proportion

   If $a/b = c/d$, then $a-b/c = c-d/d$

   Ex. $3/6 = 4/8$, then $3-6/6 = 4-8/8$, $-3/6 = -4/8$

5. Numerator - Denominator Sum Property of Equal Ratios

   If $a/b = c/d = e/f = \ldots$, then $\frac{a+c+e+\ldots}{b+d+f+\ldots} = a/b = c/d \ldots$

   Ex. $2/4 = 3/6 = 4/8 = \ldots$, then $\frac{2+3+4+\ldots}{4+6+8+\ldots} = 2/4 = 3/6 \ldots$

8-3-2 Activity: Solving Proportions

1. Name the properties of the proportions illustrated.

   (a) If 2/3 - 4/6, then 2+3/3 = 4+6/6

   (b) If 2/4 = 4/8, then 2 x 8 = 4 x 4

   (c) If 1/2 = 4/8 = 5/10, then $\frac{1+4+5}{2+8+10} = 1/2$

   (d) If 2/3 = 4/6, then 3/2 = 6/4

2. Give the value of "x" in each of the following proportions:

   (a) 4/x = 3/9 (b) x/3 = 5/2 (c) 3/5 = x/4

   (d) 2/x = 3/9 (e) 3/2 = 15/x (f) 3/x = 75/100

Test the correctness of each of the following proportions:

3. 5/8 = 35/56

4. 7/6 = 35/30

5. 23/42 = 115/219

6. 3.2/10 = 1.6/5

7. Arrange the numbers 6, 15, 30, and 12 so as to form a proportion.

8. The numbers, listed in order, are the first three terms of a proportion. Find the fourth term.

   (a) 2, 3, 4 (b) 6, 2, 8 (c) 1/2, 2/3, 3/4

8-4-2 Activity: Solving Verbal Problems Involving Ratio and Proportion

1. The ratio of boys to girls in our house care service class is 2 to 3 and there are 12 girls. How many boys are enrolled?

2. A motorist finds that he has used 3 gallons of gasoline traveling 45 miles. If he plans to cover a distance of 120 miles, how many gallons of gasoline will he need for the entire trip?

3. In cleaning a building with 16 windows, Harry cleaned the first three windows in 40 minutes. At that rate, how long will it take him to complete the entire job?

4. A salesman received a commission of $75. on sales amounting to $1,500. If he wishes to earn $225. each month by selling goods at that rate of commission, what must be the amount of his sales per month?

5. In a factory, a workman can turn out 9 pieces of completed work in 15 minutes. How many pieces of completed work can be produced in 3 hours at the same rate?

6. If 6 lbs. of meat cost $8.40, what will 20 lbs. cost at the same rate?

7. A carpet is 10 ft. wide. What is its length if the ratio of its width to its length is 2 to 3.

8. If 1 gallon of paint will cover 400 square feet, how many gallons will be needed to paint the walls of a hall that is 40 ft. long, 6 ft. wide, and 10 ft. high?

9. A garden is 20 ft. long. Find its width if the ratio of its width to its length is 2 to 5.

10. The dimensions of a room are in the ratio of 3 to 4. The room is longer than it is wide, and its width is 12 ft. How long is the room?

8-5-1 UNIT TEST: RATIO AND PROPORTION

1. Ratio can be defined as the _____ of two numbers.

2. Write the following pairs of numbers as ratios in two different ways.
First number to second number

(a) 3,4 _____, _____ (f) 9,4 _____, _____

(b) 7,9 _____, _____ (g) 30,10 _____, _____

(c) 12,15 _____, _____ (h) 100,25 _____, _____

(d) 4,5 _____, _____ (i) 150,15 _____, _____

(e) 11,15 _____, _____ (j) 7,35 _____, _____

3. For each pair of numbers below, use the quotient in lowest terms to write a sentence comparing the first number to the second.

Example: 4,12 4/12 = 1/3
4 is 1/3 times 12

(a) 15,30 _____, _____

(b) 6,16 _____, _____

(c) 5,20 _____, _____

(d) 25,32 _____, _____

(e) 8,64 _____, _____

(f) 42,7 _____, _____

(g) 27,9 _____, _____

(h) 16,4 _____, _____

(i) 32,8 _____, _____

(j) 48,16 _____, _____

4. Express the following denominate numbers as ratios in lowest terms.

(a) 3" to 9" _____

(b) 4 in. to 2 ft. _____

(c) 3 pts. to 1 gal. _____

(d) 3 nickels to 1 quarter _____

(e) 2 doz. to 12 _____

(f) 20 sec. to 45 sec. _____

(g) 55¢ to 90¢ _____

(h) 3 mo. to 2 years _____

(i) 35 min. to 2 1/2 hrs. _____

(j) 2 1/2 ft. to 5 yds. _____

(k) 5 lbs. to 36 oz. _____

(l) 2 hrs. 20 min. to 5 hrs. _____

5. A number sentence stating two equivalent ratios is called a _____.

6. The first and last terms in the number sentence are called the _____ and the two middle terms are called the _____.

7. If two ratios are equivalent, the product of the _____ must equal the product of the _____.

8. Which of the following ratios are equivalent?

(a) 3/4 : 9/12 (e) 3/10 : 5/15

(b) 5/8 : 10/16 (f) 15/32 : 32/64

(c) 1/3 : 5/6 (g) 3/8 : 9/16

(d) 8/9 : 56/63 (h) 2/5 : 15/25

9. Find the missing term in the following proportions.

(a) 3/4 = x/16 (f) 7/12 = x/36

(b) 5/32 = 2/x (g) 2/3 = x/18

(c) 2/10 = x/40 (h) 9/16 = 27/x

(d) 5/8 = 15/x (i) 15/16 = 75/x

(e) 5/6 = x/12

INSTRUCTIONAL MATERIALS

8-0-0 Unit VIII: Ratio and Proportion

8-1-0 Filmstrip - "Ratio and Proportion", chalk and chalkboard

8-1-2 Activity sheet

8-2-1 Overhead projector

8-2-2 Activity sheet

8-3-1 Study sheet

8-3-2 Activity sheet

8-4-2 Activity sheet

8-5-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT IX
Introduction to Algebra

9-0-0 Upon completion of this unit the students will demonstrate a basic knowledge of algebra by scoring 70% or above on a teacher-made test.

9-1-0 The project teacher will use a number line and lecture to introduce directed numbers.

9-1-1 Filmstrip - "Understanding Signed Numbers"

9-2-0 The project teacher will use filmstrips, number line, and lecture to teach addition of directed numbers.

9-2-1 Lecture and filmstrip - "Addition of Directed Numbers"

9-2-2 Activity: Adding Directed Numbers

9-3-0 The project teacher will use filmstrips, number line, and lecture to teach subtraction of directed numbers.

9-3-1 Lecture and filmstrip - "Subtracting Directed Numbers"

9-3-2 Activity: Subtracting Directed Numbers

9-4-0 The project teacher will use filmstrips, number line, and lecture to teach multiplication of directed numbers.

9-4-1 Lecture and filmstrip - "Multiplying Directed Numbers"

9-4-2 Activity: Multiplying Directed Numbers

9-5-0 The project teacher will use filmstrips and lecture to teach dividing directed numbers.

9-5-1 Lecture and filmstrip - "Dividing Directed Numbers"

9-5-2 Activity: Dividing Directed Numbers

9-6-0 The project teacher will use Wollensak tapes, filmstrips, and lecture to teach the meaning of sets.

9-6-1 Filmstrip - "Sets and Subsets"

9-6-2 Activity: Meaning of Sets - Kinds of Sets

9-6-3 Activity: Relationship Between Sets

9-6-4 Activity: Graphing of Sets

9-7-0 The project teacher will use lecture and chalkboard to teach punctuation marks or symbols of inclusion in algebra.

9-7-1 Activity: Symbols of Inclusion

9-7-2 Activity: Order of Operation

9-7-3 Supplementary Activity: Using Order of Operations and Symbols of Inclusion (Game)

9-8-0 The project teacher will use lecture and filmstrip to teach solving simple equations.

9-8-1 Activity: Writing Mathematical Statements or Formulas

9-8-2 Activity: Evaluating Formulas

9-8-3 Activity: Solving Equations by Subtraction

9-8-4 Activity: Solving Equations by Addition

9-8-5 Activity: Solving Equations by Division

9-8-6 Activity: Solving Equations by Multiplication

9-8-7 Activity: Solving Combination Equations

9-8-8 Activity: Solving Fractional Equations

9-8-9 Activity: Solving and Graphing Inequalities

9-9-0 The project teacher will use filmstrips, lecture, and discussion to teach graphing.

9-9-1 Lecture on graphing linear equations

9-9-2 Activity: Graphing Linear Equations by Plotting Points

9-9-3 Activity: Graphing Linear Equations by Slope-Intercept Form

9-10-0 The project teacher will use lecture and chalkboard to teach power and roots.

9-10-1 Activity: Using Exponents

9-10-2 Activity: Prime Factors

9-10-3 Activity: Finding Square Roots
(a) Perfect Squares
(b) Table of Square Roots
(c) Long Method

9-10-4 Activity: Simplifying Radicals

9-10-5 Activity: Square Roots of Fractions

9-10-6 Activity: Combining Square Roots

9-10-7 Activity: Multiplying Square Roots

9-10-8 Activity: Dividing Square Roots

9-10-9 Activity: Rationalizing Denominators

9-10-10 Activity: Square Roots in Equations

9-11-0 The project teacher will use lecture and discussion to teach practical problems related to house care services.

9-11-1 Activity: Practical Problems in Mathematics Related to House Care Services

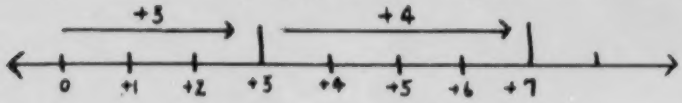
9-12-0 The project teacher will administer a teacher-made test on Algebra.

9-12-1 Unit Test

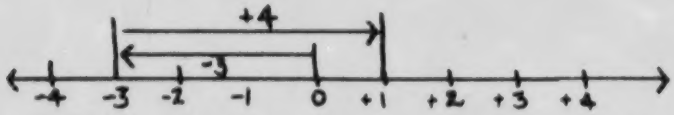
9-2-2 Activity: Addition of Directed Numbers

To add on the number line, we began at the point marked zero and use the sign placed to the upper left of the numeral to determine the direction to move. A move to the right is indicated by a positive (+) and a move to the left is indicated by a negative (-).

Example: To add +3 and +4 you begin at zero and move 3 units to the right, then 4 units to the right which will stop you on +7 as indicated in diagram below.



To add -3 and +4 you begin at zero and go 3 units left then 4 units right.



1. Follow the examples above and draw diagrams to indicate the addition of the following directed numbers.

a. +2 and +3	d. -2 and -3	+5 and -4
b. +3 and +4	e. +4 and -2	-6 and +10
c. -4 and +5	f. -6 and -2	+11 and 14

2. Add the following:

a. +6 +7	b. -10 +12	c. -36 - 4	d. +17 -17	e. -22 +24	f. - 6 -11

g. -4
+6
-11

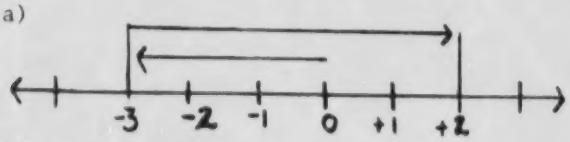
h. (-7) + (+12)

i. 6 - 9 - 3

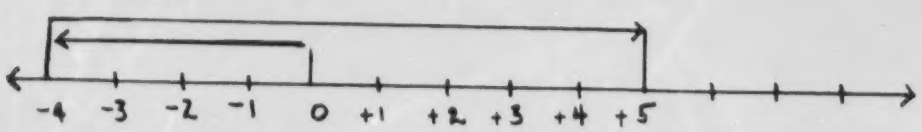
j. -2 + 5 + 2

3. Write a number sentence for each of the following diagrams.

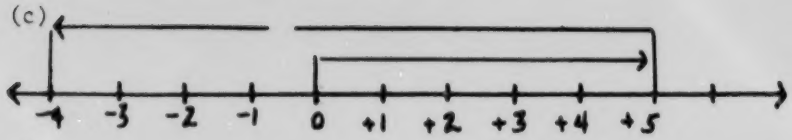
(a)



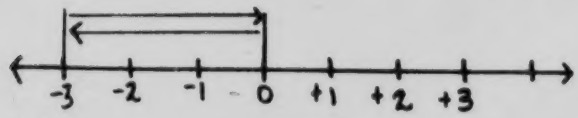
(b)



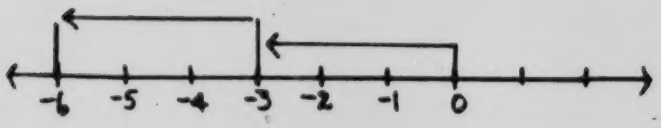
(c)



(d)



(e)



4. Add the following: Express answers to lowest terms:

a. $\begin{array}{r} -\ 3/4 \\ \underline{-\ 1/2} \end{array}$ b. $\begin{array}{r} +\ 5/6 \\ \underline{-\ 1/6} \end{array}$ c. $\begin{array}{r} +\ 2/3 \\ \underline{+\ 1/4} \end{array}$ d. $\begin{array}{r} +\ 1\ 15/16 \\ \underline{-\ \ 3/8} \end{array}$

e. $\begin{array}{r} +\ 2\ 5/8 \\ \underline{+\ 1\ 1/4} \end{array}$ f. $(-\ 2/3) + (+\ 1/4) + (-\ 5/6)$

g. $-\ 1\ 1/4 + (-\ 3/8) + 1\ 1/2$ h. $-\ 1/2 + 2/3 + 5/6$

i. $-3/16 + 5/16 + 3/16$ j. $1/8 + (-3/8) + 5/8$

k. $5/32 + (-3/64) + 5/8$ l. $-\ 1/4 + 1/2 + 3/4$

m. $\begin{array}{r} .4 \\ \underline{.2} \end{array}$ n. $\begin{array}{r} .05 \\ \underline{.5} \end{array}$ o. $\begin{array}{r} -.5 \\ \underline{-.2} \end{array}$ p. $\begin{array}{r} -.15 \\ \underline{-.06} \end{array}$ q. $\begin{array}{r} -.5 \\ \underline{+.3} \end{array}$

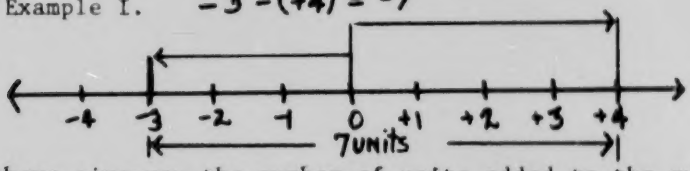
r. $(-.4) + (.3) + (-.03)$ s. $-1.5 + .14 + (-1.65)$

t. $-126.5 + (-.65)$ u. $.275 + (-.008)$

9-3-2 Activity: Subtraction of Directed Numbers

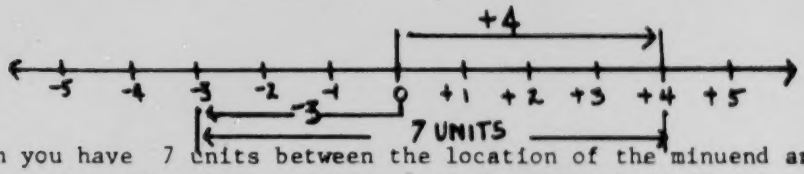
To subtract on the number line you begin at zero and locate both the minuend and subtrahend by counting from zero left for negative and right for positive, then count the number of units between the two locations as shown below.

Example I. $-3-(+4)=-7$



The above gives you the number of units added to the subtrahend to get the minuend. Since -7 must be added to a +4 to obtain a -3, the answer is -7.

Example II. $+4-(-3)=+7$



Again you have 7 units between the location of the minuend and subtrahend on the number line. Since -3 is the subtrahend you must add a positive 7 to a -3 to get the minuend +4. Therefore, the answer is 7.

1. By use of the examples above draw a number line and indicate the correct difference of the following subtraction problems.

   a. +2 - (+1)
   b. -4 + (+3)
   c. -5 - (-5)
   d. 7 - (-2)
   e. -4 - (-4)

2. Find the difference of the following:

Subtract:

a. +7 +4	b. +12 - 4	c. -6 +3	d. +9 +2	e. -11 +2
f. +25 -6	g. +12 + 5	h. +6 +14	i. -12 - 7	j. +26 - 5
k. - 1 1/2 + 2/3	l. - 4 1/2 + 2 1/2	m. + 5/6 - 2/3	n. 15/16 - 3/4	o. -25/32 - 3/8

p. $-.1 + .3$

q. $+2.65 - 1.02$

r. $-5.2 + 3.5$

s. $-5.6 + 1.3$

t. $-15.9 - 4.6$

9-4-2 Activity: Multiplying Directed Numbers

When multiplying directed numbers with like signs, two plus signs or two minus signs, the product is always positive.

Example: (+2) x (+9) = +18 or (-4) x (-9) = +36

Multiply the following:

1. (+9) x (+9)
2. (+6) x (+7)
3. (+8) x (+6)
4. (+.92) x (+.3)
5. (+ 1/8) x (+ 1/3)
6. (-9) x (-5)
7. (-5) x (-11)
8. (-12) x (-10)
9. (-.001) x (-.09)
10. (- 1/2) x (-1/2)

When multiplying directed numbers with unlike signs, a plus and a minus or a minus and a plus, the product is always negative.

Example: (+2) x (-8) = -16 or (-5) x (+8) = -40

Multiply the following:

11. (+8) x (-7)
12. (+12) x (-8)
13. (+6) x (-9)
14. (+ 1/8) x (- 1/4)
15. (+.4) x (-.5)
16. (-9) x (+5)
17. (-15) x (+5)
18. (-6) x (+6)
19. (-.51) x (+.2)
20. (- 1/2) x (+ 1/4)

When multiplying directed numbers with several factors, the product is positive if there is an even number of minus signs and negative if there is an odd number of minus signs.

Example: (+2)(-3)(-2)(+3) = +36 or (-1)(-2)(+2)(-3) = -12

21. (+2)(-2)(-3) =
22. (-1)(+4)(-3) =
23. (-1)(-1)(+2)(-1)(-2) =
24. (- 1/2) (1/4)(-1/3) =
25. (-.1)(+.1)(-.1) =
26. (-1)(-1)(-2) =
27. (+1)(-3)(-2)(-4) =
28. (-1)(+1)(+2)(-2)(+3)(-4) =
29. (- 1/2)(- 1/2)(- 1/2) =
30. (-.2)(-.2)(-.3) =

Additional multiplication exercises

31. $(+ 1/2)\ (-6) =$

32. $(-1/2)(+4)(-7) =$

33. $(-7)(-11) =$

34. $(-.3)(+.5) =$

35. $(+8)(+.5) =$

36. $(-2)(-3)(-4)(+4) =$

37. $(+ 1/8)(- 1/2)(-16)(+14) =$

38. $(-23)(-3) =$

39. $(-75)(+3) =$

40. $(- 1/2)(- 1/2)(+ 1/3)(+ 1/3)(-36)(-1) =$

9-5-2 Activity: Dividing Directed Numbers

When dividing directed numbers with like signs, two plus signs or two minus signs, the quotient is always positive.

Example: $(+81) \div (+9) = +9$ or $(-72) \div (-36) = +2$

1. $(+36) \div (+4) =$
2. $(+55) \div (+5) =$
3. $(+225) \div (+15) =$
4. $(+ 3/8) \div (+ 3/4) =$
5. $(+.256) \div (+.16) =$
6. $(-45) \div (-5) =$
7. $(-75) \div (-15) =$
8. $(-42) \div (-3) =$
9. $(-1.21) \div (-1.1) =$
10. $(-16) \div (-1/2) =$

When dividing directed numbers with unlike signs, a plus and a minus, the quotient is always negative.

Example: $(+12) \div (-4) = -3$ or $(-16) \div (+8) = -2$

11. $(+21) \div (-7) =$
12. $(+66) \div (-3) =$
13. $(+125) \div (-25) =$
14. $(+70) \div (-.35) =$
15. $(+ 1/3) \div (- 2/5) =$
16. $(-63) \div (+7) =$
17. $(-150) \div (+5) =$
18. $(-78) \div (+39) =$
19. $(- 1.44) \div (+1.2) =$
20. $(- 3/5) \div (+11/15) =$

Problems involving both multiplication and division.

21. $(+6)(-4) \div (-12) =$
22. $(-8)(-7) \div (-2) =$
23. $(+9) \div (-3)(-4) =$
24. $(-300) \div (-30) \div (+2)(-8) =$
25. $(-1/6)(-3/4) \div (+1/4) =$
26. $(+.1)(-.1)(-.1) \div (-.001) =$
27. $(-1/2)(+1/2) \div (-1/2) =$
28. $(-1/8)(-1/4) \div (-1/32) =$
29. $(-.225) \div (-.5)(-.5) =$
30. $(-3/4) \div (-3/4)(-.45) =$

9-6-2 Activity: Meaning of Sets - Kinds of Sets

Meaning of Membership in a Set

One is accustomed to talking about different kinds of collections of objects. A set of dishes, a chemistry set, a mechanics set of tools, and a pair of shoes, are familiar examples of collections of objects. In Mathematics such collections of objects are called a set. Each object of the set is called an element of the set.

A set can be specified by listing the objects forming the set within braces $\{\}$. For example, $R = \{0,3,7,8,14\}$. We use a special symbol, $\in$, to mean "is an element of," and $\notin$ to mean "is not an element of." Thus, $7 \in R$ and $10 \notin R$.

Specifying a set by listing its elements in braces gives you a roster of the set. For example, $\{1,2,3,4,5,6,7,8,9,\}$. Writing within the brace a rule which describes the elements of a set is the Rule Method. For example, $\{$the whole numbers between 0 and 10$\}$.

A set which has so many elements that the process of counting them would never come to and end is called an infinite set. For example, you cannot list all the numbers of $\{$whole numbers$\}$. If you start to write $\{0,1,2,3,4,5,6,...\}$ you will never come to the end of the list. The three dots after the 6 are the mathematician's way of indicating that the roster continues without end.

A set is finite, or has a finite number of elements, if the process of counting the elements comes to an end. For example, $\{$two-digit numbers$\} = \{10, 11, 12, \ldots 99\}$. In this example, the three dots mean and so on through.

The set that contains no elements is called the empty set or null set. Empty braces $\{\}$ might be used, but a special symbol $\emptyset$ witten without braces, usually is used to designate the null set. For example, the set of whole numbers between 8 and 9, is the null set.

Give a roster for each set, and state whether it is Finite of Infinite.

Sample: {Even whole numbers between 1 and 9}
Solution: {2, 4, 6, 8, Finite.}

1. {the whole numbers between 7 and 10}
2. {the letters in the word mechanics}
3. {the five-headed people}
4. {the odd numbers between 0 and 10}
5. {the even numbers less than 20 and greater than 9}
6. {the months of the year which have fewer than 30 days}
7. {the even numbers between 200 and 1000}
8. {all the odd numbers}
9. {all whole numbers between 7 and 8}
10. {all odd numbers between 1 and 7}
11. {all multiples of 7}
12. {all whole numbers whose squares are less than 40}
13. {Persons now 2000 years of age}
14. {Vowels in the word field}
15. {letters of the alphabet}
16. {the days of the week whose names begin with the letter T}
17. {the months whose names begin with the letter T}
18. {numbers which are roots of the equation X - 16 = 0}
19. {the days of the week which begin with letter K}
20. {all the integers great than 7}

Use the rule method to specify each of the following sets. In some cases two or more rules are possible. You are required to give only one rule.

Sample: {11, 12, 13,..., 20}
Solution: The whole numbers from 11 to 20, inclusive or
{the whole numbers greater than 10 and less than 21}

1. {1, 3, 5, 7}
2. {10, 12, 14, 16, 18}
3. {January, June, July}
4. {Red, White, Blue}
5. {1, 2, 3,...}
6. {2, 4, 6,...}
7. {Alaska, Alabama, Arizona, Arkansas}
8. {2, 3, 4}
9. {2, 4, 6}
10. {a, 3, 1, o, u}
11. {1/2, 1/3, 1/4, 1/5}
12. {1/2, 1/4, 1/6, 1/8, 1/10}
13. {1/32, 5/32, 1/2, 5/8, 3/4, 15/16}
14. {Saturday, Sunday}
15. {a, b, c,..., z}

9-6-3 Activity: Relationship Between Sets

Consider the two sets A and B where
$A = \{1, 2, 3, 6, 8\}$. $B = \{1, 2, 6\}$

Here, every element of B is also an element of A. When a set has the property that all its elements are also elements of a second set, it is called a subset of the second set. Thus B is a subset of A. When the subset does not contain all the elements of the given set, it is said to be a Proper subset.

Another subset of A is formed when you remove no elements. Thus, the full set $\{1, 2, 3, 6, 8\}$ is also a subset of A, but it is called an Improper subset. You can see that every set is a subset of itself.

The empty set, $\emptyset$, is considered to be a proper subset of every set except itself. Since it contains no elements, it is true that all its elements belong to every set.

Let $U = \{3, 15, 10\}$. List all of the subsets of U that:

1. Have exactly one element
2. Have exactly two elements
3. Have three elements
4. Have no elements
5. Consist of elements less than 3
6. Have even numbers for elements

Given: $A = \{1, 2, 3, \ldots, 9\}$. Which of the following are subsets of A?

7. $\{1, 2\}$
8. $\{8\}$
9. $\{3, 5, 11\}$
10. $\{7, 8, 9\}$
11. $\{0\}$
12. $\{1, 2, 3, \ldots, 8\}$
13. $\{1, 2, 3, \ldots, 9\}$
14. $\emptyset$

9-7-1 Activity: Symbols of Inclusion

Symbols of inclusion such as parentheses, (), brackets, [], braces {}, or bar - , are used in Mathematics to enclose an expression for a particular number. In simplifying an expression, you use the signs of grouping to determine the order of operation. When one grouping is used inside of another grouping, you always simplify the numeral in the innermost symbol of inclusion and proceed to work toward the outermost grouping until all symbols of inclusion are removed. For example.

$$\begin{aligned} 6\left[4 + (8 \times 3)\right] &= 6\left\{4 + 24\right\} \\ &= 6\left\{28\right\} \\ &= 168 \end{aligned}$$

Simplify each of the following expressions.

(1) $5 + (4 \times 2)$ (2) $(8+4)+5$ (3) $4(4+6)$

(4) $\dfrac{15 + 5}{6 + 4}$ (5) $4\left[2+1-2\right]+6$ (6) $0 \times \left[4+(2 \times 3)\right]$

(7) $\dfrac{25-9}{5-3}$ (8) $(16+4) \div \left(\left[3 \times 2\right] \div 4\right)$

(9) $\left[30 \div (5 \times 3)\right] \div 3$ (10) $\dfrac{100 - 64}{10 - 8}$

(11) $(27 \div 9) + \left[(27 \div 9) \div 3\right]$ (12) $\dfrac{100 - 64}{10 + 8} \div 12$

(13) $\left(\left[3 \times 2\right] \div 4\right)$ (14) $\dfrac{15 - 5}{2 \times 10}$ (15) $\left[\dfrac{12+8}{9 \times 6} \quad \dfrac{+1}{54}\right] \quad \dfrac{1}{54}$

(16) $(3+9) \div 9 \times 3 + 2$ (17) $\left[\left(\dfrac{50 + 25}{15}\right) \div 5\right] +1$

(18) $(4 \times 3) - (4 \div 3) \div 8$

(19) $\left[\left\{\left(\dfrac{100 - 36}{1 + 7} - 8\right) \times 3\right\} + 5\right] \times 200$

(20) $\left[(\sqrt{4 \times 2} + \sqrt{6 \times 10} - \sqrt{3 \times 20}) + 56\right] \div 13$

9-7-2 Activity: Order of Operation

Parentheses and other symbols of inclusion are the usual means used to make clear the meaning of a numerical expression. However, mathematicians have agreed on a rule to use when symbols of inclusion are omitted. The following rule should be used to simplify expressions.

1. Simplify the expression within each symbol of inclusion.
2. Perform the multiplications and divisions in order from left to right.
3. Perform the additions and subtractions in order from left to right.

Simplify each of the following expressions:

(1) $6-3-2$

(2) $3\ (4)+7$

(3) $20\div4\div2$

(4) $81x5x0$

(5) $14x1\div7$

(6) $80\div8-80\div10$

(7) $18-6\ (3)+5$

(8) $39x9x39x1$

(9) $5(7+9)\div4+3$

(10) $8\div2 + 6\div3$

(11) $\frac{32\div8+3}{7}$

(12) $5+4-(3-1)$

(13) $5+4-3-1$

(14) $12x6\div3x2\div48$

(15) $5(7-4)\div3+2$

(16) $\frac{4(3+1)-1}{4+1}$

(17) $(2x3-12\div3)\div2$

(18) $(15-3+8\div2)\ 8x5$

(19) $3+48-16-35\div7$

(20) $\frac{1+44\div4+12x44}{3x3-3\div3+2}$

9-7-3 Supplementary Activity: Using Order of Operations and Symbols of Inclusion (Game)

Using their knowledge of order of operations, have students write the numbers 1 through 20 using four fours.

Example:

$1 = \frac{4 + 4}{4 + 4}$ $\qquad\qquad$ $2 = 4 \div 4 + 4 \div 4$

9-8-1 Activity: Writing Mathematical Statements and Formulas

Express each of the following as a formula:

1. The selling price (s) is equal to the sum of the cost (c) and the profit (p).

2. The rate of discount (r) is equal to the discount (d) divided by the list price (l).

3. The gain (g) equals selling price (s) minus cost (c).

4. Interest (I) equals principal (p) times rate (r) times time in years (t).

5. Amount (A) equals principal (P) plus interest (I).

6. The capital (C) of a busijess is the difference between the assets (A) and the liabilities (L).

7. A floor cleaning company buys cleaning fluid for $3.25 a gallon. Write a formula expressing the rule for finding the amount of money the floor cleaning company spends for cleaning fluid.

8. The cost of gasoline (c) is equal to 51.9 cents per number of gallons (g).

9. The perimeter of a triangle is equal to the sum of the lengths of its sides. P = the length of the perimeter; a = the length of one side; b = thelength of another side; c = the length of the third side.

10. The circumference (C) of a circle equals about three times the diameter (D).

9-8-2 Activity: Evaluating Formulas

Find the value of the following:

1. A, when P = 125 and i = 19, using formula A = P + i.

2. r, when d = 171 and t = 9, using formula r = d/t.

3. D, when r = 55 mph., t = 3 hours, using formula D = rt.

4. C, when G = 9 gallons, 7 gallons, 6.3 gallons, using formula C = 51.9 G.

5. Find the area of a rectanglular plot of grass 60 feet long and 25 feet wide. Use A = lw, where A represents the area, l represents the length, and w represents the width.

6. How many square yards of carpeting are in a rug 9 feet by 12 feet? A = lw

7. Find the length of the perimeter of a triangle whose sides are 2 1/4 yds., 5 yds., and 4 1/2 yds. P = a + b + c

8. Using the formula t = 15 p - 20, find the time needed for cooking meat. Here, t = the time in minutes, and p = the number of pounds of meat. Find t if p = 8, p = 5, p = 10

9. What is the interest on $240. for 3 yrs. at 6%? i = prt

10. Change 80° C to the Fahrenheit scale. F = 9C/5 + 32

11. A temperature of 50 F is equal to what temperature centigrade? C = 5/9 (F - 32)

9-8-3 Activity: Solving Equations by Subtraction

Solve the following equations:

1. X + 3 = 13
2. X + 29 = 54
3. 11 + N = 27
4. 51 + X = 69
5. 65 = y + 19
6. 39 = X + 39
7. 9 = 6 + N
8. 32 = 17 + c
9. 94 = 56 + T
10. X + 3/4 = 9
11. 2 2/7 + X = 4 1/4
12. N + .9 = 6.3
13. $15 = N + $2.75
14. 12 = N + 5 3/8
15. c + 5 = 7.3
16. N + 3/5 = 2 1/10
17. x + 1.9 = 7.4
18. N + 1 3/4 = 3 4/16
19. N + 1/5 = 2 1/4
20. N + 9.9 = 11

9-8-4 Activity: Solving Equations by Addition

Solve the following equations:

1. N - 3 = 8
2. X - 12 = 9
3. X - 7 = 18
4. 15 = N - 5
5. 64 = x - 33
6. N - 9 = 9
7. 41 = N - 41
8. 0 = x - 20
9. N - 1/2 = 3/4
10. X - 7 1/2 = 5
11. 9 = N - 2 3/8
12. 5 3/4 = N - 5 1/4
13. N - .9 = 3.4
14. 9.3 = X - 7
15. X - $.08 = $.83
16. N - $1.55 = $.75
17. X - .3 = 4.7
18. 6 1/2 = N - 7/8
19. N - $.28 = $.12
20. 32 = X - 20

9-8-6 Activity: Solving Equations by Multiplication

Solve the following equations:

1. $x/3 = 7$
2. $N/6 = 4$
3. $N/7 = 0$
4. $9 = x/4$
5. $N/4 = 15$
6. $x/12 = 5$
7. $16 = N/20$
8. $x/10 = 12$
9. $N/8 = 1.8$
10. $X/1.04 = 60$
11. $1/2\ N = 27$
12. $1/3\ X = \$.54$
13. $X/7 = 1$
14. $N/2 = 48$
15. $\$1.25 = 1/8\ N$
16. $1/4\ X = 9$
17. $30 = x/6$
18. $N/.5 = .5$
19. $\frac{N}{1/2} = 3/8$
20. $\frac{X}{1/2} = 1/4$
21. $\frac{X}{1\ 1/2} = 1\ 1/4$
22. $N/1.005 = 32.04$
23. $1\ 1/2 = X/2$
24. $1\ 3/8 = X/4$

9-8-7 Activity: Solving Combination Equations

Solve the following equations:

1. $3X + 7 = 31$
2. $8N + 9 = 57$
3. $5N + 6 = 71$
4. $9X + 8 = 80$
5. $6N + 13 = 35$
6. $7X + 19 = 68$
7. $12N + 35 = 59$
8. $70 = 11N + 26$
9. $8N - 45 = 45$
10. $4N - 13 = 11$
11. $18N - 45 = 45$
12. $4N - 23 = 19$
13. $7N - 3N = 28$
14. $5N = 52 - 27$
15. $1.8X + 32 = 68$
16. $30 + .6X = 45$
17. $2/5\ N = 8$
18. $5/8\ N - 8 = 22$
19. $15 = 12X - 57$
20. $3/5\ N = \$.87$
21. $N + 1/2\ N = 4\ 1/2$
22. $3/4\ N = 8.46$
23. $N - .25N = \$.81$
24. $X + .12X = 560$
25. $9N - 4N + 2N = 63$

9-8-8 Activity: Solving Fractional Equations

(1) $\frac{x}{5} - \frac{x}{10} = \frac{1}{10}$ (2) $\frac{x}{4} - \frac{x}{8} = \frac{3}{8}$ (3) $\frac{1}{3a} + \frac{1}{4a} = \frac{7}{2}$

(4) $\frac{1}{4x} + \frac{1}{5x} = \frac{9}{2}$ (5) $\frac{2}{3} - \frac{2}{5} = 1$ (6) $\frac{3}{7} - \frac{1}{3} = 4$

(7) $.02C = .01C - .1$ (8) $\frac{2a}{3} + 1 = \frac{a}{2}$ (9) $3a - \frac{7}{3a} = 1$

(10) $.5x - 1.4x - .9$ (11) $\frac{x}{5} - \frac{x}{3} = \frac{6}{5}$ (12) $\frac{a}{7} - \frac{a}{4} = \frac{6}{7}$

(13) $\frac{4}{3b} = \frac{1}{2b} + 45$ (14) $\frac{3}{4y} = 26 - \frac{1}{3y}$ (15) $\frac{3a - 5}{2} - \frac{a}{3} = 8$

(16) $\frac{3}{2} + \frac{8-2b}{7} = 1$ (17) $2/9(x-3) - 3 = 1/3(2x+5)$

(18) $\frac{a+3}{8} - \frac{a-2}{6} = 1$ (19) $\frac{x+5}{12} - \frac{x+3}{8} = 1$

(20) $.03x + .05 (1000 - x) - 34$

9-8-9 Activity: Solving and Graphing Inequalities

Solve and graph on a number line:

(1) $x + 1 > 5$ (2) $y - 1 < 2$ (3) $3x + 7 = 10$

(4) $2x + 1 > 5$ (5) $3a - 1 \leq 8$ (6) $2x \geq 0$

(7) $5x - 1 > 9$ (8) $2 - 3x < 11$ (9) $7 + \frac{x}{4} \leq 0$

(10) $\frac{3x}{4} - 2 < -5$ (11) $26 \geq -10 + 4n$ (12) $8 + \frac{n}{3} \geq 0$

(13) $5 - 2a > 17$ (14) $6a - 3(4-2a) \geq 0$

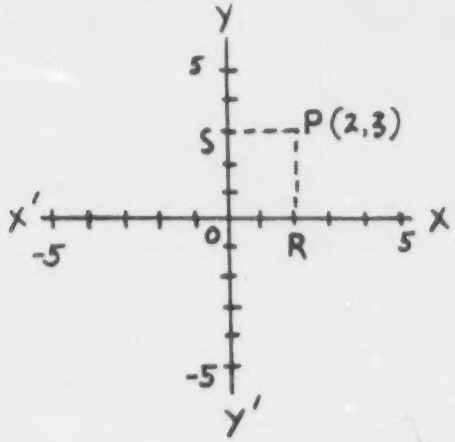
(15) $-x + 2(4-x) \leq 0$ (16) $-12\left(\frac{x}{6} - \frac{1}{3}\right) < 2x$

(17) $7(x+3) - 5(x-3) \geq 2(x+20) - 4$

(18) $-3 \leq x + 4 \leq 0$

9-9-2 Activity: Graphing Linear Equations by Plotting Points

Linear equations are equations which, when graphed yield a straight line. Equations will be graphed on a grid, using a rectangular coordinate system similar to the following.



XX' is called the horisontal axis.
YY' is called the vertical axis.
Point O, where the axis cross, is called the origin. The distance of a point from the two axis determines its position. Thus for point P, PS is the distance of the point from the Y-axis and is called the abscissa. PR is the distance of the point from the X-axis and is called the ordinate. Together, the abscissa and ordinate of a point are called its coordinates. Distances counted on the X-axis to the right of the origin are positive and to the left of the origin are negative. Distances counted on the Y-axis above the origin are positive and below the origin are negative.

The coordinator of point P are (2, 3) because to arrive at point P, you begin at the origin and move 2 units to the right, there the abscissa is +2. Next you move up three units, thus the ordinate is +3. Both an abscissa and ordinate are always required to locate a point.

Activity: On a set of axis, locate the following points.

(1) (+4, +6) (2) (+5, -7) (3) (-2, 0)

(4) (-4, _6) (5) (-7,-3) (6) (-2, 0)

(7) (0, +5) (8) (0, 0) (9) (0, -8)

(10) (-4, -4)

The axes divide the graph into four distinct parts. These four parts are called quadrants and are numbered in the manner below.

All points in the first quadrant have a positive abscissa and a positive ordinate. Points in the second quadrant have a negative abscissa and a positive ordinate. Points in the third quadrant have a negative abscissa and a negative ordinate.

To graph an equation of the form $8x + 4y = 12$, first solve the equation for y.

$$4y = 8x + 12$$

$$y = -2x + 3$$

Next, make a table for values of x.

x	y
0	
2	
-1	
-2	

Then find the corresponding values for y.

x	y
0	3
2	-1
-1	5
-2	7

If $x = 0$, then $y = -2(0) + 3$

$y = 3$

If $x = 2$, then $y = -2(2) + 3$

$y = -4 + 3$

$y = -1$

If $x = -1$, then $y = -2(-1) + 3$

$y = 2 + 3$

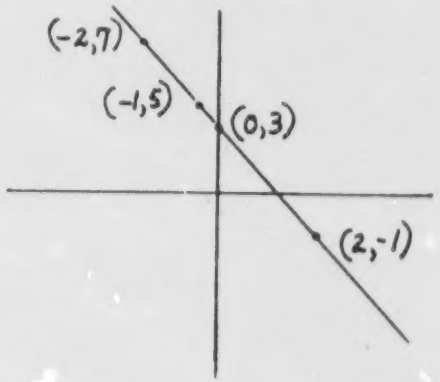
$y = 5$

If $x = -2$, then $y = -2(-2) + 3$

$y = 4 + 3$

$y = 7$

After completing the table f values for x and y, locate these coordinates of a set of axis.



Finally draw a line through these points and if no mistakes have been made, the result will be a straight line.

Graph the following, using the method discussed above:

(1) $x - y = 6$ (2) $x + y = 8$ (3) $y = x = 6$

(4) $2x - 7 = 8$ (5) $2x + y = 12$ (6) $x - 2y = 10$

(7) $x - 3y = 9$ (8) $3x = y$ (9) $x = 2y$

(10) $3x - 5y = 15$ (11) $2x - 3y = 12$ (12) $y = \frac{1}{2}x - 5$

9-9-3 Activity: Graphing Linear Equations by Slope-Intercept Form

Another method of gr hing a linear equation is by the slope-intercept method. The slope of a line is the ratio of the rise to the run. For example, a line with a slope of 2/3, has a vertical change of 2 units for each horizontal line is the point where the graph of the line crosses the y - axis. An equation of the form y = mx + b is said to be in the slope-intercept form. The m represents the slope and the b represents the y - intercept. The following procudure should be used to graph an equation by this method.

Graph: $-2x + 3y = 6$

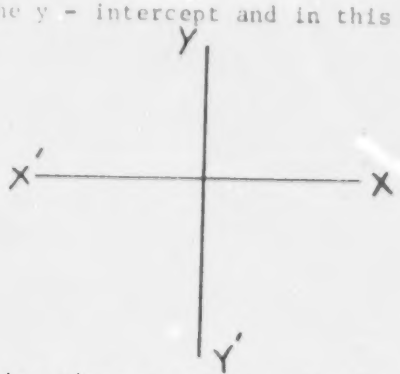
First solve the equation for y.

$3y = 2x + 6$

$y = 2/3x + 2$

The equation is now in slope-intercept form. Since the coefficient of x is the slope, this equation has a slope of positive 2/3.

The constant is the y - intercept and in this case it is positive two.



Next, on a set of axis, place a point on the Y - acis two units above the origin. This is the y-intercept. Now beginnng at this point, count three units to the right since the slope is positive, then two units up. Place a point here and draw a straight line connecting the two points. This line represents the equation y = 2/3 x +2.

Note: If the slope is negative, begin at the y - intercept and count to the left instead of the right. The rise is always counted up.

Graph the following, using the slope intercept form.

(1) $y - 3x = 4$	(2) $7x + y = 5$	(3) $x + 2y - 3 = 0$
(4) $x + 3y + 6 = 0$	(5) $2x - 5y = 0$	(6) $4x - 7y = 0$
(7) $15x + 3y + 4 = 0$	(8) $6y - 7x - 9 = 0$	(9) $x\ 3y = 9$
(10) $3x + y$	(11) $x = 2y$	(12) $2x - 3y = 12$

9-10-1 Activity: Using Exponents

An exponent tells how many times a number is used as a factor. For example, 3^4 means $3 \cdot 3 \cdot 3 \cdot 3$, thus $3^4 = 81$.

Find the value of the following:

1. 2^3
2. 3^3
3. 4^2
4. 2^5
5. 5^3
6. 7^2
7. 8^3
8. 3^5
9. 10^3
10. 12^2
11. 2^6
12. 4^5
13. 2^8
14. 7^3
15. 5^4
16. 8^6
17. 3^4
18. 10^4
19. 12^3
20. 6^4

Rewrite the following using exponents:

1. $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$
2. $12 \cdot 12 \cdot 12$
3. $4 \cdot 4$
4. $6 \cdot 6 \cdot 6$
5. $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
6. $10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$
7. $1 \cdot 1 \cdot 1$
8. $5 \cdot 5 \cdot 5$
9. $100 \cdot 100$
10. $8 \cdot 8 \cdot 8 \cdot 8 \cdot 8$
11. $5 \cdot 5 \cdot 5 \cdot 5$
12. $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
13. $a \cdot a \cdot a \cdot a$
14. $b \cdot b$
15. $7 \cdot 7 \cdot 7$
16. $N \cdot N \cdot N \cdot N \cdot N \cdot N$
17. $12 \cdot 12 \cdot 12 \cdot 12$
18. $100 \cdot 100 \cdot 100$
19. $M \cdot M \cdot M$
20. $15 \cdot 15$

9-10-2 Activity: Prime Factors

Any number can be expressed as the product of primes. For example, 12 can be written 2x2x3 so that all the factors are prime numbers.

Find the prime factors of each of the following:

1. 14	6. 5	11. 225	16. 182
2. 8	7. 100	12. 500	17. 12
3. 16	8. 81	13. 392	18. 6
4. 25	9. 125	14. 90	19. 20
5. 36	10. 169	15. 210	20. 75

9-10-3 Activity: Finding Square Roots

Find the square root of the following perfect square numbers.

1. $\sqrt{9}$
2. $\sqrt{16}$
3. $\sqrt{25}$
4. $\sqrt{36}$
5. $\sqrt{4}$
6. $\sqrt{49}$
7. $\sqrt{64}$
8. $\sqrt{81}$
9. $\sqrt{100}$
10. $\sqrt{121}$
11. $\sqrt{144}$
12. $\sqrt{169}$
13. $\sqrt{196}$
14. $\sqrt{225}$
15. $\sqrt{256}$

Using the table of square roots, find the following:

1. $\sqrt{7}$
2. $\sqrt{10}$
3. $\sqrt{15}$
4. $\sqrt{5}$
5. $\sqrt{2}$
6. $\sqrt{97}$
7. $\sqrt{13}$
8. $\sqrt{43}$
9. $\sqrt{21}$
10. $\sqrt{52}$
11. $\sqrt{26}$
12. $\sqrt{55}$
13. $\sqrt{77}$
14. $\sqrt{83}$
15. $\sqrt{72}$

Find the square root of the following correct to tenths by the long method:

1. $\sqrt{81}$
2. $\sqrt{69}$
3. $\sqrt{10.4}$
4. $\sqrt{171}$
5. $\sqrt{175.43}$
6. $\sqrt{3}$
7. $\sqrt{2}$
8. $\sqrt{9.142}$
9. $\sqrt{23.04}$
10. $\sqrt{17145}$
11. $\sqrt{29}$
12. $\sqrt{6.82}$
13. $\sqrt{200}$
14. $\sqrt{4.9}$
15. $\sqrt{576}$

9-10-4 Activity: Simplifying Radicals

Another method simplifying certain radicals is to simplify a square root of a product. For example: Notice that $\sqrt{28} = \sqrt{4 \times 7} = \sqrt{4} \times \sqrt{7} = 2\sqrt{7}$. Since $\sqrt{7} = 2{,}646$, $2\sqrt{7} = 2 \times 2.646 = 5.292$, or 5.29. 5.29 is the value of $\sqrt{28}$ correct to the hundredths rule. The square root of a product of two or more numbers is the product of the square roots of the numbers.

In each example, find the simpliest radical form to the nearest hundredths.

1. $\sqrt{12}$
2. $\sqrt{24}$
3. $\sqrt{45}$
4. $\sqrt{27}$
5. $\sqrt{18}$
6. $\sqrt{20}$
7. $\sqrt{44}$
8. $\sqrt{32}$
9. $\sqrt{40}$
10. $\sqrt{48}$
11. $\sqrt{52}$
12. $\sqrt{60}$
13. $\sqrt{63}$
14. $\sqrt{72}$
15. $\sqrt{84}$
16. $\sqrt{90}$
17. $\sqrt{75}$
18. $\sqrt{98}$
19. $\sqrt{125}$
20. $\sqrt{128}$

9-10-5 Activity: Square Root of Fractions

Notice that $\sqrt{\frac{9}{16}} = \frac{3}{4}$ also $\frac{\sqrt{9}}{\sqrt{16}} = \frac{3}{4}$

Therefore $\sqrt{\frac{9}{16}} = \frac{\sqrt{9}}{\sqrt{16}}$

Rule: The square root of the quotient of two numbers is the quotient of the square roots of the number.

Example 1. $\sqrt{\frac{3}{2}} = \frac{\sqrt{6}}{\sqrt{4}} = \frac{\sqrt{6}}{\sqrt{4}} = \frac{\sqrt{6}}{2}$ or $\frac{1}{2}\sqrt{6}$

Since $\sqrt{6} = 2.449$, $\sqrt{\frac{3}{2}}$ or $\frac{1}{2}\sqrt{6} = \frac{1}{2} \times 2.449$

$\therefore \sqrt{\frac{3}{2}} = 1.224$, or 1.22

Simplify the radical to the nearest hundredth.

1. $\sqrt{\frac{5}{8}}$
2. $\sqrt{\frac{2}{5}}$
3. $\sqrt{\frac{3}{4}}$
4. $\sqrt{\frac{2}{3}}$
5. $\sqrt{\frac{5}{6}}$
6. $\sqrt{\frac{7}{8}}$
7. $\sqrt{\frac{9}{10}}$
8. $\sqrt{\frac{5}{18}}$
9. $\sqrt{\frac{7}{2}}$
10. $\sqrt{\frac{1}{a}}$
11. $\sqrt{\frac{a}{b}}$
12. $\sqrt{\frac{a}{b}^2}$
13. $\sqrt{\frac{c}{d}^2}$
14. $\sqrt{\frac{9}{8}}$
15. $\sqrt{\frac{5}{14}}$

9-10-6 Activity: Combining Square Roots

In all mathematics only like quantities can be combined. For example: $2x + 3x = 5x$; but $2x$ and $3y$ cannot be combined.

Example 1. Simplify $2\sqrt{3} - 4\sqrt{3} + 5\sqrt{3}$ correct to the nearest hundredth.

Solution:

1. $2\sqrt{3} - 4\sqrt{3} + 5\sqrt{3} = (2-4+5)\sqrt{3}$, or $3\sqrt{5}$
2. $\sqrt{3} = 1.732$ $3\sqrt{3} \times 1.732$ or 5.196
3. $\therefore$ $2\sqrt{3} - 4\sqrt{3} + 5\sqrt{3} = 3\sqrt{3}$ or 5.20

Simplify each example and find the value of the result. Correct to the nearest tenth.

1. $\sqrt{18} + \sqrt{8}$
2. $\sqrt{12} + \sqrt{75}$
3. $\sqrt{32} + \sqrt{50}$
4. $\sqrt{27} - 2\sqrt{3}$
5. $\sqrt{20} - \sqrt{45}$
6. $\sqrt{54} - \sqrt{24}$
7. $7\sqrt{6} + \sqrt{24}$
8. $3\sqrt{11} - \sqrt{44}$
9. $\sqrt{8} + \sqrt{\frac{1}{2}}$
10. $\sqrt{24} + \sqrt{2/3}$
11. $\sqrt{60} + \sqrt{3/5}$
12. $\sqrt{28} + 2\sqrt{7} - \sqrt{63}$
13. $\sqrt{75} - \sqrt{27} + \sqrt{12}$
14. $\sqrt{32} - \sqrt{50} + \sqrt{18}$
15. $\sqrt{24} + \sqrt{54} - 5\sqrt{6}$

9-10-7 Activity: Multipl, ng Square Roots

Rule: The product of the square roots of two or more numbers.

Example 1. (a) $\sqrt{4} \times \sqrt{9} = \sqrt{36}$

(b) $\sqrt{5} \times \sqrt{3} = \sqrt{15}$

Simplify the given expression correct to the nearest tenth.

1. $\sqrt{2} \times \sqrt{18}$
2. $\sqrt{6} \times \sqrt{3}$
3. $\sqrt{8} \times \sqrt{6}$
4. $\sqrt{12} \times \sqrt{2}$
5. $\sqrt{15} \times \sqrt{6}$
6. $\sqrt{18} \times \sqrt{3}$
7. $\sqrt{20} \times \sqrt{10}$
8. $3\sqrt{8} \times \sqrt{2}$
9. $5\sqrt{2} \times \sqrt{12}$
10. $\sqrt{32} \times \sqrt{8}$

9-10-8 Activity: Dividing Square Roots

Rule: The quotient of the square roots of two numbers is the square root of the quotient of the numbers.

Example 1: $\sqrt{15} \div \sqrt{3} = \sqrt{15 \div 3} = \sqrt{5}$

Example 2: $\frac{6\sqrt{14}}{3\sqrt{2}} = \frac{6}{3}\sqrt{\frac{14}{2}} = 2\sqrt{7}$ since

$\sqrt{7} = 2.646$, then $2\sqrt{7} = 2 \times 2.646 = 5.292$ or 5.29

Simplify by dividing, then find the result correct to the nearest hundredth.

1. $\sqrt{12} \div \sqrt{2}$
2. $\sqrt{15} \div \sqrt{5}$
3. $\sqrt{64} \div \sqrt{2}$
4. $\sqrt{27} \div \sqrt{3}$
5. $\sqrt{40} \div \sqrt{5}$
6. $\sqrt{76} \div \sqrt{19}$
7. $\frac{5\sqrt{3}}{2\sqrt{3}}$
8. $\frac{8\sqrt{5}}{2\sqrt{5}}$
9. $\frac{6\sqrt{27}}{3\sqrt{3}}$
10. $\frac{10\sqrt{20}}{5\sqrt{5}}$
11. $\frac{2\sqrt{28}}{6\sqrt{7}}$
12. $\frac{3\sqrt{36}}{2\sqrt{12}}$
13. $\frac{5\sqrt{18}}{3\sqrt{2}}$
14. $\frac{4\sqrt{44}}{2\sqrt{11}}$
15. $\frac{16\sqrt{20}}{2\sqrt{5}}$

9-10-9 Activity: Rationalizing Denominators

A fraction is never in simpliest form when it contains a radical in the denominator. To simplify a fraction of this type the following procedure is used.

$$\frac{15}{\sqrt{20}}$$

First multiply both numerator and denominator by some number so that the denominator will be a perfect square. In this case it will be 5.

$$\frac{15}{\sqrt{20}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{15\sqrt{5}}{\sqrt{100}}$$

Next, take the square root of 100.

$$\frac{15\sqrt{5}}{10}$$

Finally, reduce the fraction to lowest terms by dividing by 5.

$$\frac{3\sqrt{5}}{2} \quad \text{or} \quad \frac{3}{2}\sqrt{5}$$

Simplify the following in this manner.

(1) $\frac{6}{\sqrt{3}}$ (2) $\frac{12}{\sqrt{6}}$ (3) $\frac{10}{\sqrt{2}}$ (4) $\frac{15}{\sqrt{5}}$

(5) $\frac{4}{\sqrt{12}}$ (6) $\frac{12}{\sqrt{18}}$ (7) $\frac{5}{\sqrt{10}}$ (8) $\frac{15}{\sqrt{32}}$

(9) $\frac{25}{\sqrt{50}}$ (10) $\frac{30}{\sqrt{40}}$ (11) $\frac{6}{\sqrt{24}}$ (12) $\frac{15}{\sqrt{45}}$

(13) $\frac{10}{2\sqrt{12}}$ (14) $\frac{15}{3\sqrt{5}}$ (15) $\frac{4}{2\sqrt{18}}$ (16) $\frac{6}{3\sqrt{20}}$

(17) $\frac{\sqrt{2}}{\sqrt{3}}$ (18) $\frac{4\sqrt{3}}{\sqrt{2}}$ (19) $\frac{10\sqrt{3}}{\sqrt{5}}$ (20) $\frac{8\sqrt{3}}{\sqrt{18}}$

(21) $\frac{\sqrt{a}}{\sqrt{b}}$ (22) $\frac{\sqrt{a}}{\sqrt{2c}}$ (23) $\frac{6}{\sqrt{3d}}$ (24) $\frac{8}{\sqrt{12x}}$

(25) $\frac{ab}{\sqrt{a}}$

9-10-10 Activity: Square Roots in Equations

Solving an equatic that contains a radical can be accomplished as follows:

Solve: $\sqrt{3x+1} = 4$ First square both sides of the equation.

$$\left(\sqrt{3x+1}\right)^2 = 4^2$$

$$3X + 1 = 16$$

After this is done the resulting equation is of a form that you have previously worked with. Subtract 1 from each nember of the equation and the result is: $3x = 15$. Now divide each member by 3 and the result is $x = 5$.

Solve the following:

(1) $\sqrt{x} = 7$

(2) $\sqrt{3y} = 1$

(3) $\sqrt{2z - 1} = 3\sqrt{3}$

(4) $5\sqrt{x} = 1$

(5) $2 = 3\sqrt{2w}$

(6) $7 = \sqrt{4t + 1}$

(7) $\sqrt{\frac{a}{3}} = 2$

(8) $\sqrt{\frac{3b}{5}} = 6$

(9) $\sqrt{\frac{c}{4} + 1} = 5$

(10) $3 = \frac{2}{\sqrt{x}}$

(11) $2 = \frac{1}{\sqrt{3y}}$

(12) $\frac{3}{\sqrt{2z+1}} = 2$

(13) $\sqrt{2x} - 3 = 5$

(14) $\sqrt{y} + 1 = 6$

(15) $\sqrt{3y} - 4 = 5$

(16) $\sqrt{5x} + 2 = 7$

(17) $9 = \sqrt{85} - 3$

(18) $7 = 3 + \sqrt{2w}$

9-11-1 Activity: Practical Problems in Algebra Related to House Care Services

Solve each of the following problems by using an equation.

1. Bertha has 39 inches of lace. She wishes to cut it so that one piece will be 5 inches longer that the other piece. How long will she cut each piece?

2. Jim cleaned 76 windows today, which was 9 less than one-third of yesterday's windows cleaned. How many windows did he clean yesterday?

3. The net profit of the Johnson Floor Cleaning Company was $2,458. and its expenses were $3,824. Find the gross income.

4. Mrs. Jones received an increase in salary of $96., making her salary $1,500. How much was her salary before the increase?

5. The price of 9 pairs of curtains is $80.55. What is the cost of one pair?

6. On a babysitting job, Susan earned the same amount each week for 12 weeks. She spent 2/3 of the money for new clothes and had $52. left. How much did she earn per week?

7. A plot of land contains 4 1/2 acres. How much additional land must be purchased in order to have 1 1/3 times as much land?

8. One clerk sold 3/4 as many yards of curtain material as another clerk. If together they sold 336 yards, how many yards did each clerk sell?

9. In a closet there were twice as many white towels as there were yellow. Mary took from the closet 1/3 of the white towels and 1/2 of the yellow towels. If Mary took out a total of 14 towels from the closet, how many white towels and how many yellow towels were there in the closet?

10. A druggist wishes to make a 10 ounce mixture containing 8% boric acid. If he has mixtures containing 5% and 10% boric acid, how many ounces of each should he use?

11. A factory floor is 120 ft. long and 75 ft. wide. How many washing machines can be placed on this floor, allowing an average of 30 sq. ft. for a machine?

12. A lady bought 8 1/3 yards of curtain material for $5. What is the cost of one yard?

13. An 8 quart container was 3/4 full of cleaning fluid. How much cleaning fluid did it contain?

14. After Paul added $60. to his savings account, he had $250. in the account. How much did he have before?

15. A general rule for guring a family budget is that rent should not exceed 25% of one's monthly income. If Sam earns $5,400. per year, what limit should be set on his monthly rent?

9-12-1 UNIT TEST

Add the following:

(1) $\begin{array}{r} +7 \\ \underline{-9} \end{array}$ (2) $\begin{array}{r} -8 \\ \underline{-7} \end{array}$ (3) $\begin{array}{r} +6 \\ \underline{+18} \end{array}$ (4) $\begin{array}{r} -12 \\ \underline{+3} \end{array}$

(5) +6 -3 +8 +2 -7

Subtract the following:

(6) $\begin{array}{r} +7 \\ \underline{+9} \end{array}$ (7) $\begin{array}{r} -8 \\ \underline{-12} \end{array}$ (8) $\begin{array}{r} +12 \\ \underline{-18} \end{array}$ (9) $\begin{array}{r} -23 \\ \underline{+14} \end{array}$

(10) (-3) - (17)

Multiply the following:

(11) (+8) (-9) (12) (-9) (+11)

(13) (-7) (-8) (14) (+6) (+8)

(15) (-1) (-1) (-2) (-2) (-1) (+1)

Divide the following:

(16) $\frac{-15}{+5}$ (17) $\frac{-26}{-13}$ (18) $\frac{+225}{+15}$ (19) $\frac{+196}{-14}$

(20) (1,2,3...10) is an example of what kind of set?

(21) (1,2,3....) is an example of what kind of set?

(22) Graph x -3 on a number lkine

Simplify the following:

(23) (9+5) -3 (24) 3 + 2 x 4 -5 (25) 12 x 2 + 3 x 6 + 48

(26) Using the formula D = rt, find r when D = 650 and t = 13.

Solve the following:

(27) 5x + 6 = 71 (28) 4a - 13 = 11 (29) 3/5x = 87

(30) $\frac{x}{5} - \frac{x}{3} = \frac{6}{5}$ (31) $\frac{x+3}{8} - \frac{x-2}{6} = 1$ (32) 3x - 1 8

(33) 5 - 2x 17 (34) Graph 3y = -15x -4

(35) Write the prime factors of 200

(36) Find the square root of 135

(37) Rewrite: $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$

(38) Simplify: $\sqrt{75}$

(39) Simplify: $\sqrt{2/3}$

(40) Combine: $\sqrt{12} + \sqrt{75}$

(41) Combine: $\sqrt{54} - \sqrt{2x}$

(42) Multiply: $\sqrt{12} \times \sqrt{3}$

(43) Multiply: $\sqrt{15} \times \sqrt{5}$

(44) Divide: $\sqrt{27} \div \sqrt{3}$

(45) Divide: $\frac{4\sqrt{44}}{2\sqrt{11}}$

(46) Simplify: $\frac{6}{\sqrt{5}}$

(47) Simplify: $\frac{6}{\sqrt{24}}$

(48) Solve: $\sqrt{3y} = 2$

(49) Solve: $\sqrt{\frac{x}{3}}$ 3

(50) Solve: $\sqrt{5x} + 2 = 7$

INSTRUCTIONAL MATERIALS

9-0-0 Unit IX: Introduction to Algebra

9-1-0 Introduce Directed Numbers

9-1-1 Number line
Filmstrip - "Understanding Signed Numbers"

9-2-0 Addition of Directed Numbers

9-2-1 Filmstrip - "Addition of Directed Numbers"

9-2-2 Activity sheet

9-3-0 Subtracting Directed Numbers

9-3-1 Filmstrip - "Subtracting Directed Numbers"

9-3-2 Activity sheet

9-4-0 Multiplication of Directed Numbers

9-4-1 Filmstrip - "Multiplication of Directed Numbers"

9-4-2 Activity sheet

9-5-0 Division of Directed Numbers

9-5-1 Filmstrip - "Dividing Directed Numbers

9-5-2 Activity sheet

9-6-0 Meaning of Sets

9-6-1 Filmstrip - "Sets and Subsets"

9-6-2 Activity sheet

9-6-3 Activity sheet

9-6-4 Activity sheet

9-7-0 Symbols of Inclusion

9-7-1 Activity sheet

9-7-2 Activity sheet

9-7-3 Game - "Symbols of Inclusion"

9-8-0 Solving Simple Equations

9-8-1 Activity sheet

9-8-2 Activity sheet

9-8-3 Activity sheet

9-8-4 Activity sheet

9-8-5 Activity sheet

9-8-6 Activity sheet

9-8-7 Activity sheet

9-8-8 Activity sheet

9-8-9 Activity sheet

9-9-0 Graphing Linear Equations

9-9-1 Graphs and charts

9-9-2 Activity sheet

9-9-3 Activity sheet

9-10-0 Powers and Roots

9-10-1 Activity sheet

9-10-2 Activity sheet

9-10-3 Activity sheet

9-10-4 Activity sheet

9-10-5 Activity sheet

9-10-6 Activity sheet

9-10-7 Activity sheet

9-10-8 Activity sheet

9-10-9 Activity sheet

9-10-10 Activity sheet

9-11-1 Activity sheet

9-12-0 Evaluation

9-12-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT X
Geometry

10-0-0 Upon completion of this unit the student will demonstrate a basic understanding of geometry and the terminology involved by scoring 70% or above on a teacher-made test.

10-1-0 The project teacher will use class discussion, films, and a guest speaker to emphasize the importance of geometry in house care services.

10-1-1 Class discussion

10-1-2 Film - "Finding Your Life's Work", #1014F

10-1-3 Guest speaker

10-1-4 Have students write several paragraphs on how geometry can be applied to house care services, using information obtained from the above sources.

10-2-0 The project teacher will use filmstrips, overhead projector, tapes, and lecture to teach the concepts of points, lines, and planes.

10-2-1 Filmstrip - "Points, Lines, and Planes"

10-2-2 Lecture, using transparencies

10-2-3 Study Sheet: Points, Lines, and Planes

10-2-4 Activity: Points, Lines, and Planes

10-2-5 Lecture, using transparencies on parallel and perpendicular lines

10-2-6 Study Sheet: Parallel and Perpendicular Lines

10-2-7 Activity: Parallel and Perpendicular Lines

10-2-8 Lecture on scale drawing

10-2-9 Study Sheet: Scale Drawing

10-2-10 Activity: Scale Drawing

10-3-0 The project teacher will use filmstrips, protractor, combination square, lecture, and class discussion to teach identification of angles and angle measurement.

10-3-1 Filmstrip - "Using the Protractor", #643110

10-3-2 Use framing square to introduce right angles.

10-3-3 Use combination square to introduce acute angles.

10-3-4 Activity: Angle I ntification and Measurement

10-3-5 Lecture on constructing angles, angle bisectors, adding and subtracting angles by construction

10-3-6 Activity: Construction Problems

10-4-0 The project teacher will use filmstrips, overhead projector, transparencies, and tapes to teach the kinds of polygons and their uses.

10-4-1 Filmstrip - "Polygon" (Box 8)

10-4-2 Transparencies - "Identifying Polygons"

10-4-3 Transparencies and study sheet on identifying triangles

10-4-4 Lecture with transparencies: "Constructing Triangles, Altitudes, and Medians"

10-4-5 Activity: Triangles

10-4-6 Study Sheet: Pythagorean Theorem

10-4-7 Activity: Pythagorean Theorem

10-4-8 Transparencies and lecture: "Identifying Quadrilaterals"

10-4-9 Study Sheet: Quadrilaterals

10-4-10 Lecture: Construction Quadrilaterals

10-4-11 Activity: Quadrilaterals

10-4-12 Field work - Balancing furniture in a room using model furniture

10-5-0 Upon completion of this topic, the house care services student will have a working knowledge of circles, areas, ellipses, and terms used in relating to them.

10-5-1 Study Sheet: Terminology of Circles, Areas, and Ellipses

10-5-2 Lecture with the aid of prepared transparencies on terminology used in circles and curves

10-5-3 Activity: Definition of Terms

10-6-0 The project teacher will administer a unit test.

10-6-1 Unit Test

10-7-0 The project teacher will assign special projects in geometric construction.

10-7-1 Special projects

10-2-3 Study Sheet: Points, Lines, and Planes

A point is represented on paper by a dot. A geometric point is an exact location in space. Any dot we generally use to indicate it is only a representation of a geometric point. A point in mathematics has no size; it has position only. Points are referred to by Capital letters.

$\overset{A}{\cdot}$ is "point A", $\overset{B}{\cdot}$ is "point B", $\overset{C}{\cdot}$ is "point C".

A geometric line is a set of points. The pencil or chalk line we draw are only representations of geometric lines. A line may be extended indefinitely in foth directions because it is endless; it has an infinite number of points but no end points. A definite part of a line has length buy no width or thickness. A line is represented as: ⟷ The arrowheads are used to show that a line is endless in both directions.

We name a line by using: (1) two labeled points on it. ⟷ read "line $\overleftrightarrow{AB}$" expressed in symbols as "$\overleftrightarrow{AB}$". Also read "line BA" and expressed as $\overleftrightarrow{BA}$. (2) A small letter near the line p ⟷ read "line p".

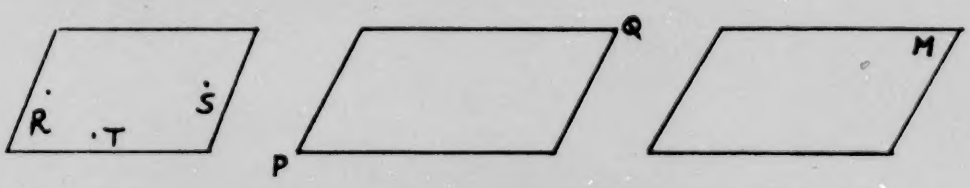
A definite part of a line including both of its endpoints is called a line segment or segment. It consists of two endpoints and all the points between. We name a line segment by its endpoints.

M——N is read "line segment MN" or "segment MN" and is expressed in symbols as $\overline{MN}$. Also read "line segment NM: and expressed as $\overline{NM}$. A small letter may be written between the endpoints.

c —— is "line segment C."

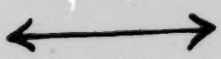
A "half-line" which includes one endpoint is called a ray. To name a ray we use the letter first which name the endpoint and then the letter which names the other point as the ray. C ⟶ D is named "ray CD," expressed in symbols as $\overrightarrow{CD}$. However, C ⟵ D is names "ray DC," expressed in symbols as $\overrightarrow{DC}$.

A plane is named by using the letters which name three points not on the same line belonging to it or by two capital letters at opposite corners or by one capital letter as shown.



Kinds of Lines:

Lines may be straight, curved, or broken.



Straight line

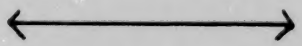
Curved line

Broken line

Position of Lines:

Lines may be in vertical, horizontal, or slanting (sometimes called oblique) positions.

Vertical Position



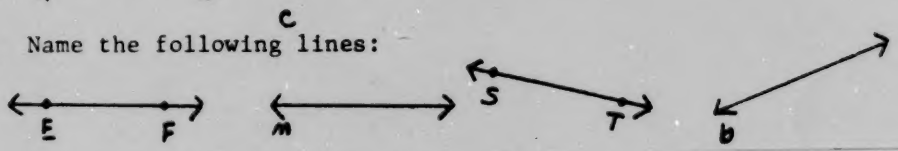
Horizontal Position

Slanting or Oblique Position

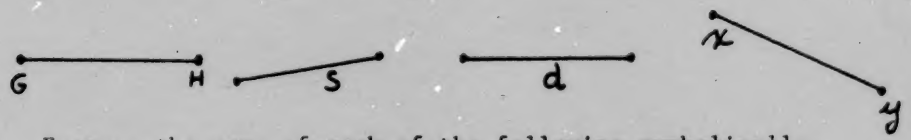
10-2-4 Activity: Points, Lines, and Planes

1. Name the endpoints of the following line segment.

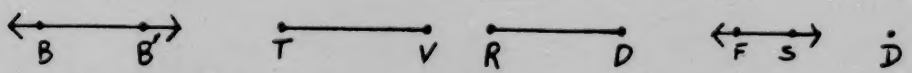
2. Name the following lines:



3. Name the following line segments:

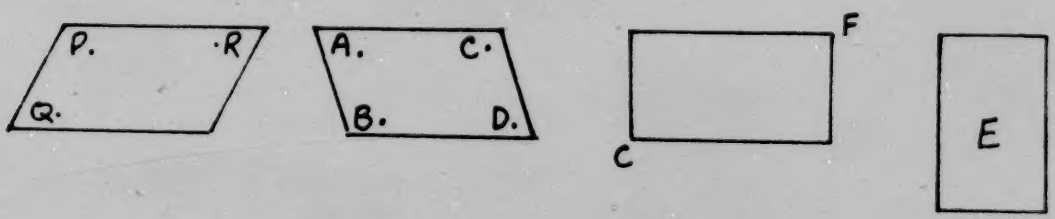


4. Express the name of each of the following symbolically.



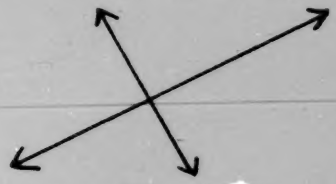
5. Name the following rays and express them symbolically.

6. Name the following planes:

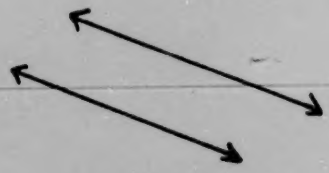


10-2-6 Study Sheet: Intersecting, Parallel, and Perpendicular Lines

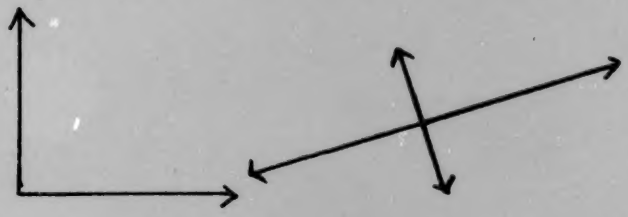
Lines that meet are intersecting lines. Two lines in the same plane that do not meet are called parallel lines. Two intersecting lines or rays; or segment of a line and ray, or a line and segment of a ray, and segment that form a right angle* are said to be perpendicular to each other.



Intersecting lines



Parallel lines

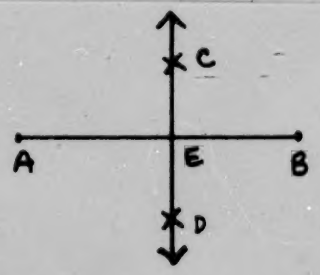


Perpendicular Rays and Lines

* Angle: The union of two rays with a common endpoint.
Right angle: Angle with a measure of 90°.

Bisecting Line Segments

To bisect a line segment means to divide it into two equal parts. (1) Using rules, first measure the line segment, then mark off half the measurement. (2) Use a compass: (see figure) To bisect $\overline{AB}$, set the compass so that the radius is more than half the length of $\overline{AB}$, with A and B as center draw arcs which cross above and below the segment at C and D. Then draw $\overleftrightarrow{CD}$ bisecting $\overline{AB}$ at E.

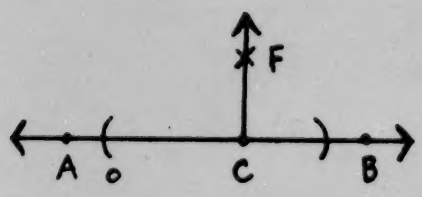


Constructing a Perpendicular to a Line at a Point on the Line.

Two lines that meet to form right angles are called perpendicular lines. The smybol $\perp$ means "is perpendicular to."

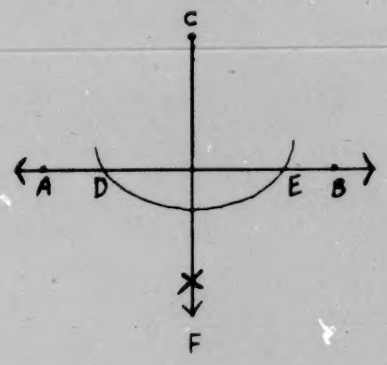
(1) Using a protractor, a 90° angle can be drawn with the given point on the line as the vertex.

(2) Using a compass (see figure): To draw a line, or ray, or segment, perpendicular to $\overleftrightarrow{AB}$ at C, we use point C as the center and with any radius we draw an arc cutting $\overleftrightarrow{AB}$ at D and E. With D and E as centers and with a radius greater than CD, we draw arcs crossing at F. We draw $\overleftrightarrow{CF}$ which is perpendicular to $\overleftrightarrow{AB}$ at point C.



Constructing a Perpendicular to a Line From a Point Outside the Line

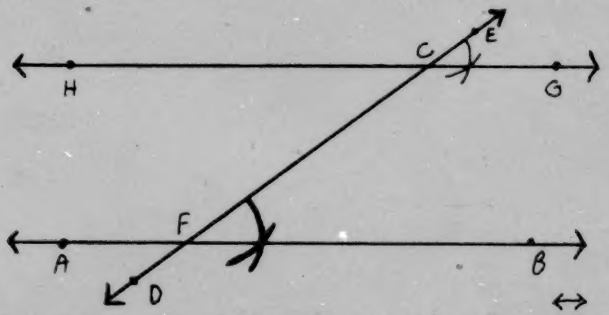
Using a compass (see figure): To draw a ray from point C perpendicular to $\overleftrightarrow{AB}$, we use point C as the center and draw an arc cutting $\overleftrightarrow{AB}$ at D and E. With D and E as center and a radius of more than one-half the distance from D to E, we draw Arcs crossing at F. We draw $\overrightarrow{CF}$ which is perpendicular to $\overleftrightarrow{AB}$.



Constructing a Parallel to a Given Line Through a Point Outside the Given Line

Lines in the same plane which do not meet are called parallel lines. The symbol $\parallel$ means "is parallel to".

To construct a line parallel to $\overleftrightarrow{AB}$ through point C (see figure), we draw any line $\overleftrightarrow{DE}$ through C meeting $\overleftrightarrow{AB}$ at F. (1) Using a protractor, we measure $\angle BFC$ and draw, at point C on $\overleftrightarrow{DE}$, $\angle GCE$ equal to the corresponding $\angle FBC$. Then we extend $\overleftrightarrow{GC}$ through H. $\overleftrightarrow{HG}$ is parallel to $\overleftrightarrow{AB}$.



(2) Using a compass, we construct, at point C on $\overleftrightarrow{DE}$, $\angle GCE$ equal to the corresponding $\angle BFC$. We then extend $\overleftrightarrow{GC}$ through H. $\overleftrightarrow{HG}$ is parallel to $\overleftrightarrow{AB}$, because they form equal corresponding angles with transversal $\overleftrightarrow{DE}$.

10-2-7 Activity: Parallel and Perpendicular Lines

1. Draw line segments: (a) 3" long (b) 3 1/4" long (c) 2 3/8 " long (d) 1 5/8" long (e) 2 3/8" long. Bisect each segment with a compass. Check with a ruler.

2. Draw a 3" segment and construct its perpendicular bisector. Check the length with a ruler and check the right angle with a protractor.

3. Draw any triangle. Bisect each side. Do the bisectors meet in a point equidistant from the vertices of the triangle?

4. Take a point on the line. Construct a perpendicular to the line at this point. Check with protractors.

5. Given line $\overleftrightarrow{AB}$, construct a line parallel to $\overleftrightarrow{AB}$ through point P. Point P does not lie on $\overleftrightarrow{AB}$.

6. Take a point outside a line. Construct a perpendicular to the line from this point. Check with protractor.

7. Construct an equilateral triangle with each side 2 5/8 inches long. From each vertex construct a perpendicular to the opposite side.

8. Draw any triangle. Construct a perpendicular from each vertex to the opposite side.

9. Construct a perpendicular from the center of a circle to any given chord. Is the chord bisected?

10. Draw a line. Through a point outside this line construct a line parallel to the first line.

11. Choose a point P on a given line l. Construct a line perpendicular to line l, through point P.

12. Construct the perpendicular bisector of a 2" line segment.

10-2-9 Study Sheet: Scale Drawing

Many times it is not practical to make full-size drawings of objects to be built. Sometimes the objects are too large, other times too small. This requires drawings which describe the objects accurately, but in a different size.

The ratio of a length on the drawing to the corresponding length on the object is called the scale. The scale shows the relationship between the dimensions of the drawing plan, or map, and the actual dimensions. A scale line 1 inch = 4 feet may also be written as 1/4" = 1 foot, or by the representative fraction 1/48 which shows that each inch equals 4 feet or 48 inches.

On maps we usually find a scale of miles like:

(1) To find the actual distance, we multiply the scale distance by the scale value of a unit (inch).
Example:
Scale: 1 inch = 20 miles
Scale distance 4 3/4 inches = miles

$$4\ 3/4 \times 20 = \frac{19}{4} \times \frac{\cancel{20}^{5}}{1} = 95 \text{ miles}$$

(2) To find the scale distance, we divide the actual distance by the scale value of a unit (inch).
Example: 1 inch = 8 feet
Scale distance = 18 feet

$$8\overline{)18}\quad 2\ 1/4$$

Answer: 2 1/4

(3) To find the scale, we divide the actual distance by the scale distance.
Example:
Actual distance = 18
Scale distance = 2 1/4"

$18 \div 2\frac{1}{4} = 18 \div 9/4 = 18 \times 4/9 = 72/9 = 8$ feet

10-2-10 Activity: Scale Drawing

1. If 1 inch = 20 miles, what distance is represented by:
   4"? 1 1/2"? 7/8"? 2 3/4"? 3 11/16"?

2. If 1/8 inch = 1 foot, what distance is represented by:
   7"? 4 1/2"? 3/4"? 9 5/8"? 2 13/16"?

3. If the scale is 1/48, what distance is represented by:
   3"? 10 1/2"? 5/8"? 14 1/4"? 59/16"?

4. If 1 inch = 80 miles, how many inches represent:
   560 mi.? 440 mi.? 150 mi.? 380 mi.? 65 mi.?

5. If 1/4 inch = 1 foot, how many inches represent:
   32'? 18'? 41'?

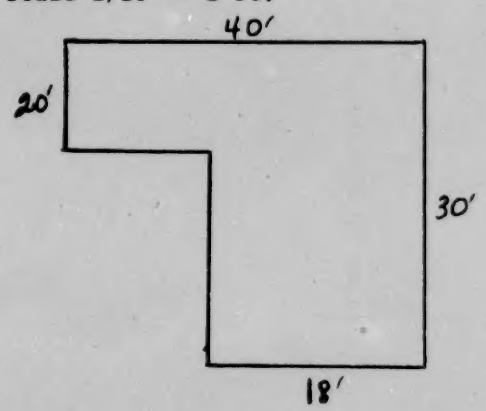
6. Using the scale 1 inch = 40 miles, draw line segments representing 70 miles; 105 miles.

7. A set of house plans is drawn to the scale of 1/4" = 1 foot. What actual length is represented by a line 1 1/4" long on the plans?

8. When the scale of a scale drawing is 1/8" = 1 foot, what actual lengths are represented by the following lengths on the drawing?
   2"? 1 3/4"? 2 5/8"? 3 1/2"?

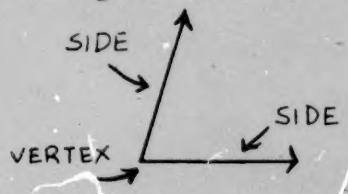
9. A room is 15 ft. by 13 ft. Make a scale drawing of the room, using the scale of 1/4" = 1 ft.

10. The sketch at the right shows the floor plan of a house. Make a drawing of the floor plan, using the scale 1/16" = 1 ft.



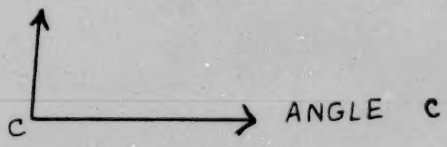
10-3-4 Activity: Angle Identification and Measurement

An angle is the figure formed by the union of two different rays having the same endpoint. This common endpoint is called the vertex of the angle and the two rays are called the sides of the angle. The symbol "$\angle$" designates the word "angle". The following illustration is a model for an angle.

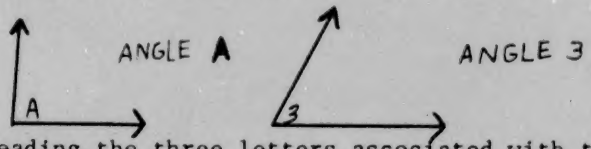


Angles are identified or names in the following way:

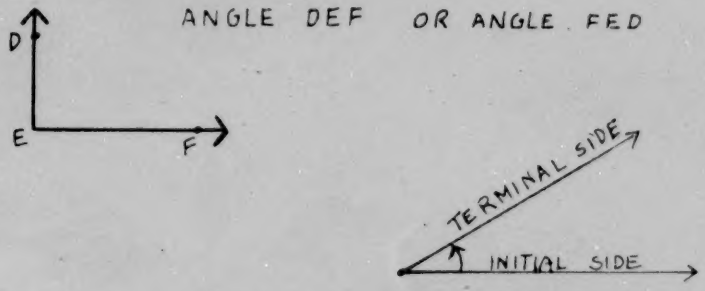
(1) By reading the capital letters at the Vertex:



(2) By reading the inside letter or numeral:

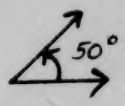


(3) By reading the three letters associated with the vertex and one point on each of the sides. The middle letter always indicates the vertex.

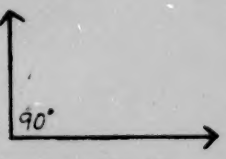


Positive angles are those formed by counterclockwise rotation, indicated by the arrow in the above illustration. The initial side of the arrow is the above illustration. The initial side of the angle is the side where rotation begins and the terminal side is where the rotation stops. Negative angles are those formed by clockwise rotation.

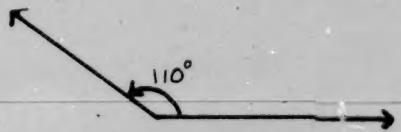
Angles are named according to the number of degrees they contain. A degree (^{o}) is 1/360 of a complete revolution or a circle. An <u>acute angle</u> is an angle that contains more than zero degrees and less than 90^{o}.



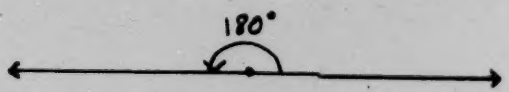
A <u>right angle</u> is an angle that contains 90^{o}.



An <u>obtuse angle</u> is an angle that contains more than 90^{o} and less than 180^{o}.



A <u>straight angle</u> is an angle that has 180^{o}.

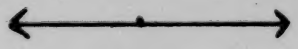


A <u>reflex angle</u> is an angle that contains more than 180^{o} and less than 360^{o}.

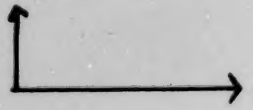
The instrument used to measure angles is called a protractor. Its use will be explained by your teacher.

Measure and identify the following angles:

1.

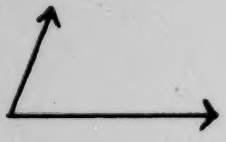


2.



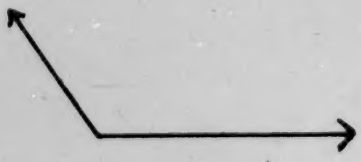
3.

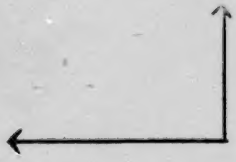
4.



5.

6.



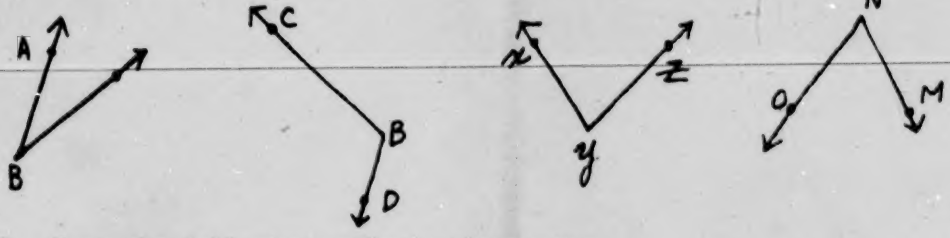
7. 

8.

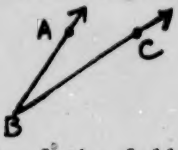
9.

10.

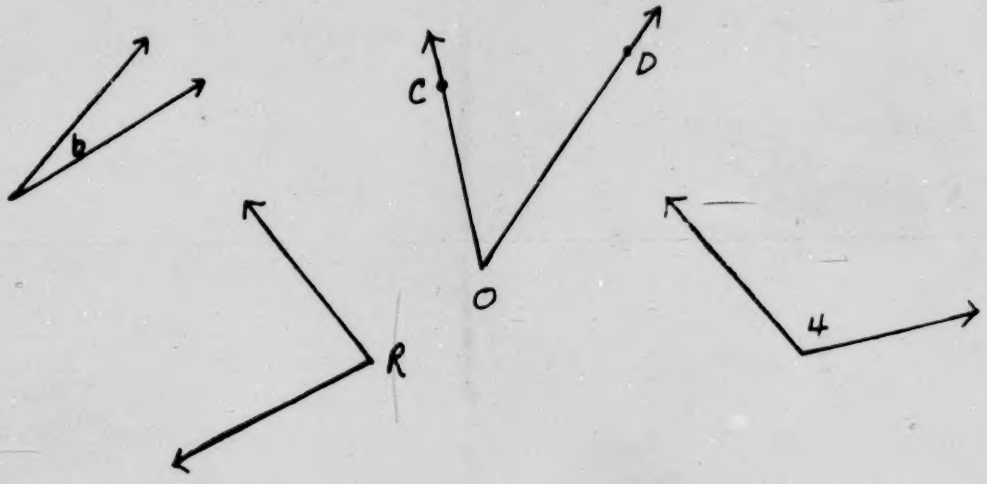
11. Name the following sides and vertex of the following:



12. Name the following angle in three ways.



13. Name each of the following angles:



10-3-6 Activity: Construction Problems

1. Draw a right angle and bisect it.

2. Draw an obtuse angle and bisect it.

3. Draw a reflex angle and divide it into 4 equal parts by construction.

4. Bisect a 50° angle.

5. Construct a 45° angle.

6. Construct a $22\ 1/2^{\circ}$ angle.

7. Bisect a straight angle.

8. Construct a 135° angle.

9. Draw an angle having 270° and bisect it.

10. Draw an angle having 160° and divide it into 8 equal parts by construction.

11. Draw an angle of 50° and construct an angle equal to it.

12. Draw angles of 40° and 50° and construct an angle equal to their sum.

13. Draw angles of 75° and 30° and construct an angle equal to their difference.

14. Draw an angle of 15° and construct an angle four times this angle.

0-4-3 Study Sheet: Polygons

A polygon is a closed broken line in a plane. Polygons can have any number of sides. Some of the more common polygons are:

Triangle	3 sides
Quadrilateral	4 sides
Pentagon	5 sides
Hexagon	6 sides
Heptagon	7 sides
Octagon	8 sides
Nonegon	9 sides
Decagon	10 sides

The traingle is used most often in construction because it is a rigid figure. Each of the three sides brace the other two. Triangles can be found in all buildings and bridges being used as braces.

Triangles are classified in two ways, by their sides and by their angles.

The following triangles are classified according to their sides:

(1) A scalene traingle is one having all three sides unequal.

SCALENE TRIANGLE

The marks on the sides of the triangle show that they are unequal since a different number of marks are used on each.

(2) An isosceles triangle is one having two sides equal.

ISOSCELES TRIANGLE

(3) An equilateral triangle is one having all three sides equal.

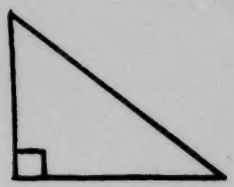
EQUILATERAL TRIANGLE

Triangles are also classified according to their angles as follows:

(1) Acute triangles are triangles which have three acute angles.

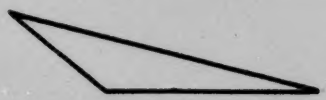
ACUTE TRIANGLE

(2) Right triangles are triangles which have one right angle.



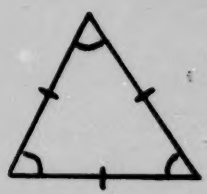
RIGHT TRIANGLE

(3) Obtuse triangles are triangles which have one obtuse angle.



OBTUSE TRIANGLE

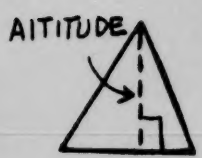
(4) Equiangular triangles are triangles that have three equal angles. Equiangular triangles are also equilateral.



EQUIANGULAR OR EQUILATERAL

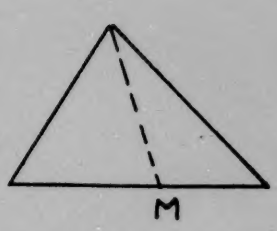
The sum of the three angles in any triangle is 180°. Thus, if two angles of a triangle are known, the third can be found by subtracting the sum of the two that are known from 180°.

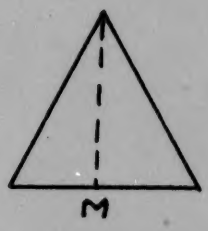
An altitude of a triangle is a line drawn from any vertex perpendicular to the opposite side or the opposite side extended. The following diagrams illustrate altitudes.

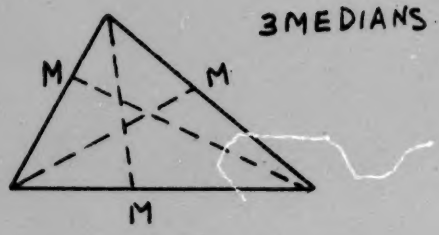


3 ALTITUDES

A median of a triangle is a line drawn from a vertex to the midpoint of the opposite side. Study the following examples.







10-4-5 Activity: Triangles

Measure the angles of the following triangles and tell whether it is an acute, right, obtuse, or equiangular triangle.

(1)

(2)

(3)

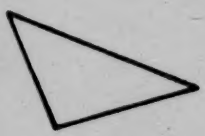
(4)

(5)

Measure the sides of the following triangles and tell whether it is a scalene, isosceles, or equilateral triangle.

(6)

(7)



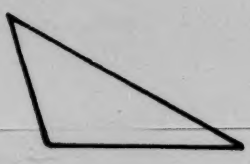
(8)

(9)

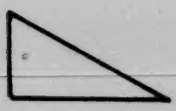
Construct one altitude in each of the following triangles.

(10)

(11)

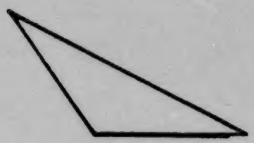


(12)

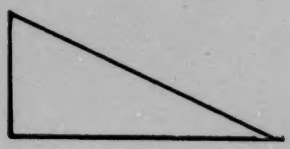


Construct one median in each of the following triangles.

(13)



(14)

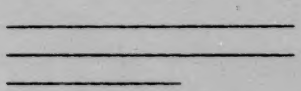


(15)

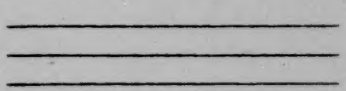
Construct a triangle having the given sides and angles. Tell what kind of triangle the result is. If any of the constructions are impossible, explain why.

(16)

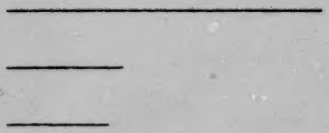
(17)



(18)

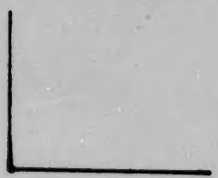


(19)



(20)

(21)



(22) Construct a right isosceles triangle.

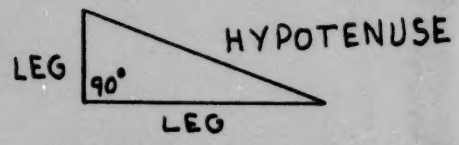
(23) Construct a right scalene triangle.

(24) Construct a right equilateral triangle.

(25) Construct a right isosceles triangle, then construct one of its medians and altitudes.

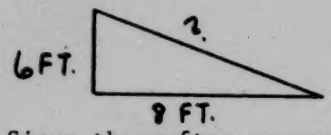
10-4-6 Study Sheet: Pythagorean Theorem

A very useful aspect of a right triangle deals with the relationship of its legs to its hypotenuse. The following diagram illustrates the parts of the right triangle.



An ancient Greek mathematician, Pythagoras discovered that the square of the hypotenuse is equal to the sum of the square of the two legs. Thus this relation between the legs and the hypotenuse is called the Pythogarean Theorm.

This theorem has many pratical applications, one of which is finding the correct length to cut a rafter. For example, if it were 6 ft. from the ridge of a roof to the ceiling joist, and 8 ft. from the center of the building to the outer wall, you could find the rafter length as follows:



Since the rafter represents the hypotenuse of the triangle, it is equal to the square root of $6^2 + 8^2$.

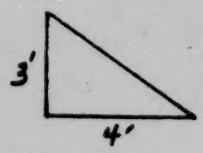
$$\text{Rafter} = \sqrt{6^2 + 8^2}$$
$$= \sqrt{36 + 64}$$
$$= \sqrt{100}$$
$$= \sqrt{10}$$

Thus the rafter would be 10 feet long plus the amount desired for an overhang.

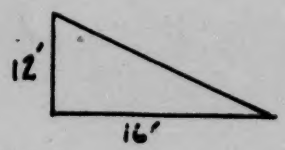
10-4-7 Activity: Pythagorean Theorem

Find the hypotenuse of the following right triangles.

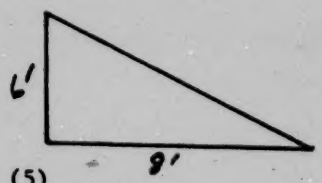
(1)



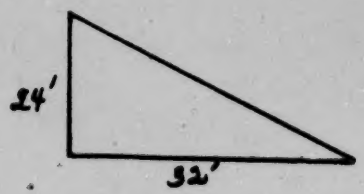
(2)



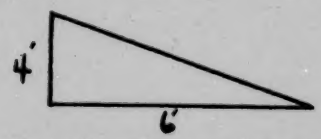
(3)



(4)

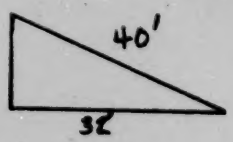


(5)

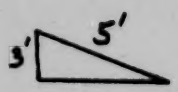


Find the missing legs of the following triangles:

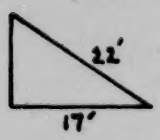
(6)



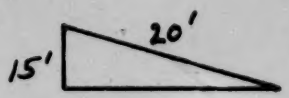
(7)



(8)



(9)



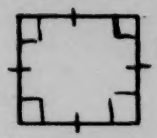
10-4-9 Study Sheet: Quadrila rals

A polygon having four sides is called a quadrilateral. Quadrilaterals are sub-divided into five groups as follows:

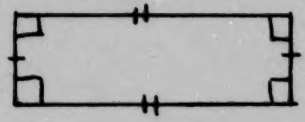
Kinds of Quadrilaterals

1. Square
2. Rectangle
3. Parallelogram
4. Rhombus
5. Trapezoid

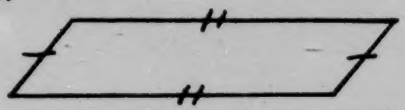
A square is a quadrilateral having four right angles and four sides equal and parallel.



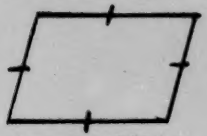
A rectangle is a quadrilateral having four right angles and the opposite sides equal and parallel.



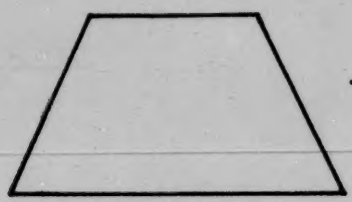
A parallelogram is a quadrilateral having the opposite sides equal and parallel.



A rhombus is a quadrilateral having four sides equal and parallel.

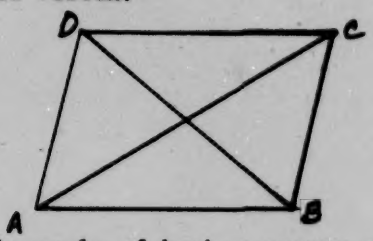


A trapezoid is a quadrilateral having one set of opposite sides parallel.



These polygons will be encountered almost daily in the construction trades. Most building foundations are in the form of a square or a rectangle or a combination of the two. A portion of a roof could be a trapezoid or a parallelogram.

A diagonal of a quadrilateral is a line drawn from one vertex to the opposite vertex.



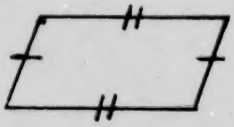
$\overline{AC}$ IS A DIAGONAL

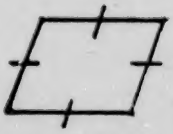
$\overline{BD}$ IS A DIAGONAL

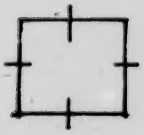
The diagonals of both a square and a rectangle are equal. One method a carpenter uses to determine if a house is square is by measuring the diagonals. If the diagonals are not equal he knows the house is not squared and must be remeasured.

10-4-11 Activity: Quadrilaterals

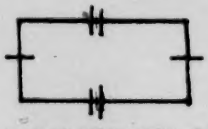
Identify the following figures:

(1) 

(2) 

(3) 

(4)

(5) 

(6) Explain how a rhombus and a square are similar. How are they different.

(7) Explain how a rectangle and a parallelogram are alike. How are they different?

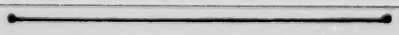
(8) Is this statement true or false? All rectangles are parallelograms, but not all parellelograms are rectangles.

(9) Is this statement true or false? All rhombuses are square, but not all squares are rhombuses.

(10) Construct a square using the following segment as the length of the sides.

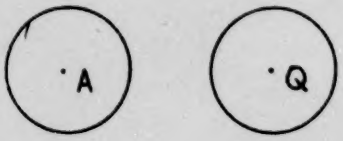
(11) Using what you have learned about diagonals, determine if the following figure is a rectangle.

(12) Construct a rectangle having the following segments as sides.



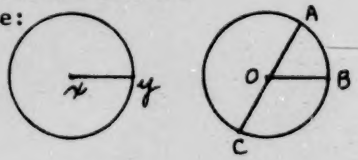
10-5-1 Study Sheet: Definitions needed to work with circles, areas, and ellipses. (To be used with related transparency)

1. Circle - a closed plane curve with all points being equidistant from the center. We refer to a circle with this symbol ⊙, and the center as ⊙A or ⊙Q.



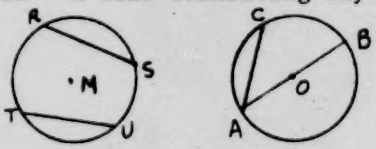
2. Radius - Line segment connecting the center of the circle with any point on the circle.

Example:



xy, ⊙A, ⊙B & ⊙C are all radii of the circles X & O.

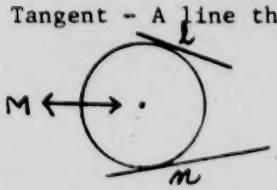
3. Chord - A line connecting any two points on a circle.



RS, TU, AC and AB are all chords.

4. Diameter - A chord that passes through the center of the circle. In the above diagram AB is a diameter of ⊙O.

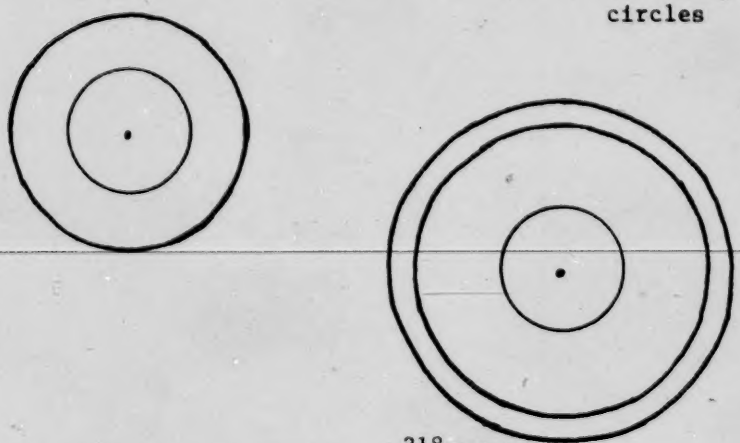
5. Tangent - A line that touches a circle at one and only one point.



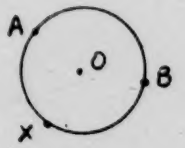
Lines l & n are tangents; M is not because it would intersect the circle at another point.

6. Concentric Circles - Circles of different sizes with the same center.

Two examples of concentric circles

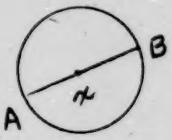


7. Arc - Section of a circle that connects two points on a circle.



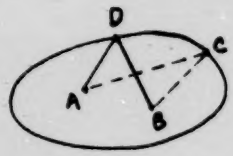
$\overset{\frown}{AB}$ is an arc referred to as $\overset{\frown}{AB}$. If we were to refer to the larger arc we would have to refer to it as $\overset{\frown}{A\ X\ B}$.

8. Semicircle - An arc that is 1/2 of a circle. In circle X, $\overset{\frown}{AB}$ is a semicircle.



9. Ellipse - An oval such that any point on the ellipse is always equal to the sum of the distance from two fixed points.

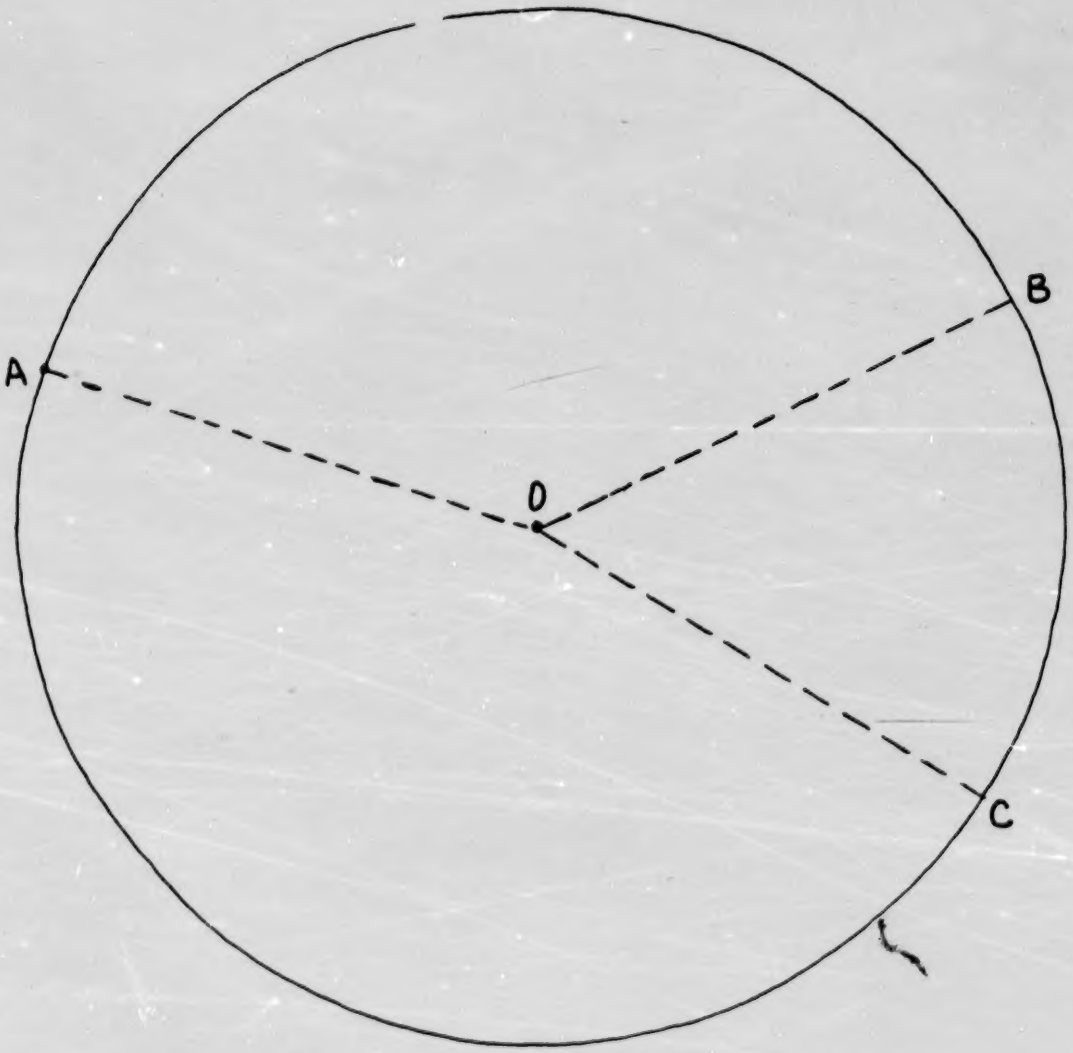
AB + BD = AC + BC

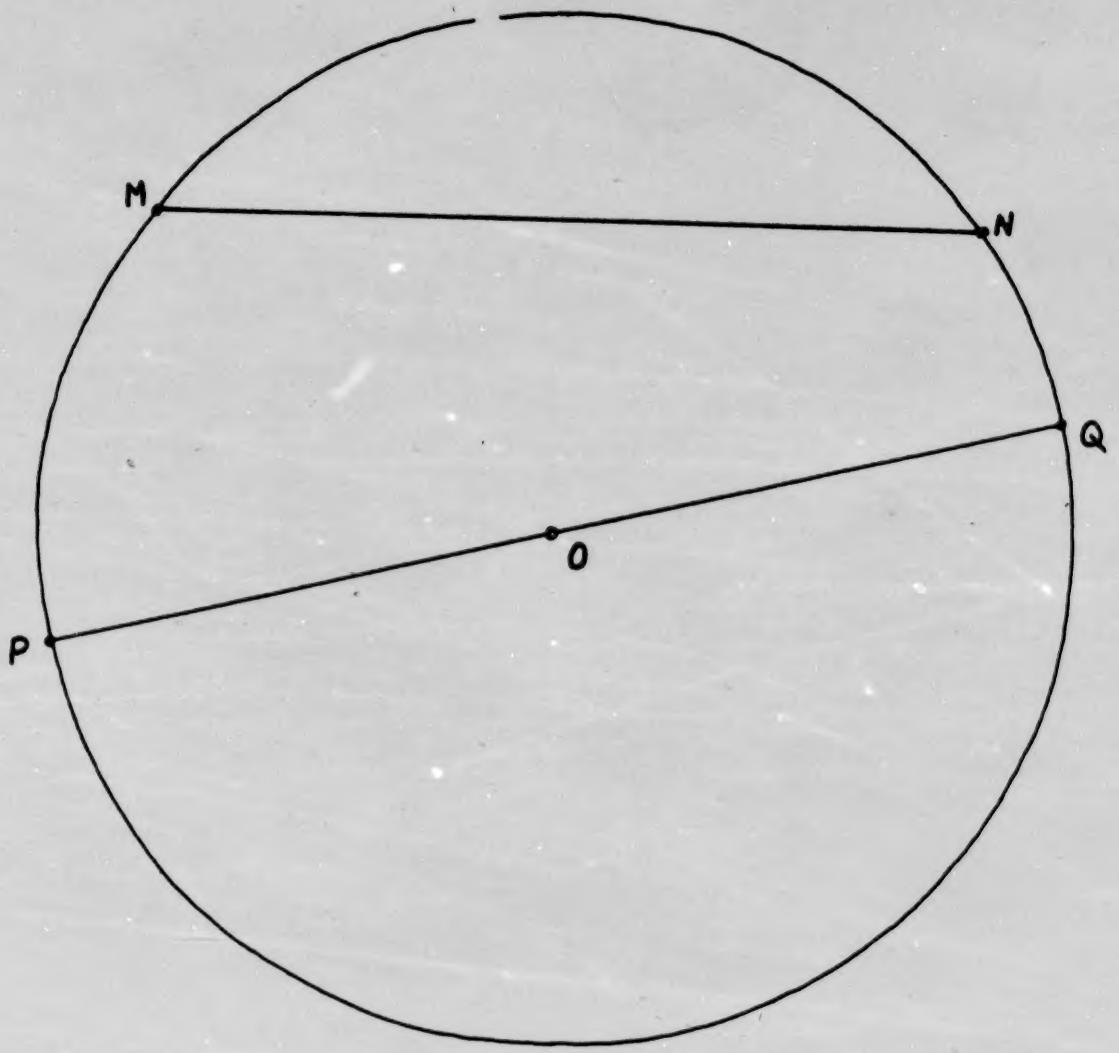


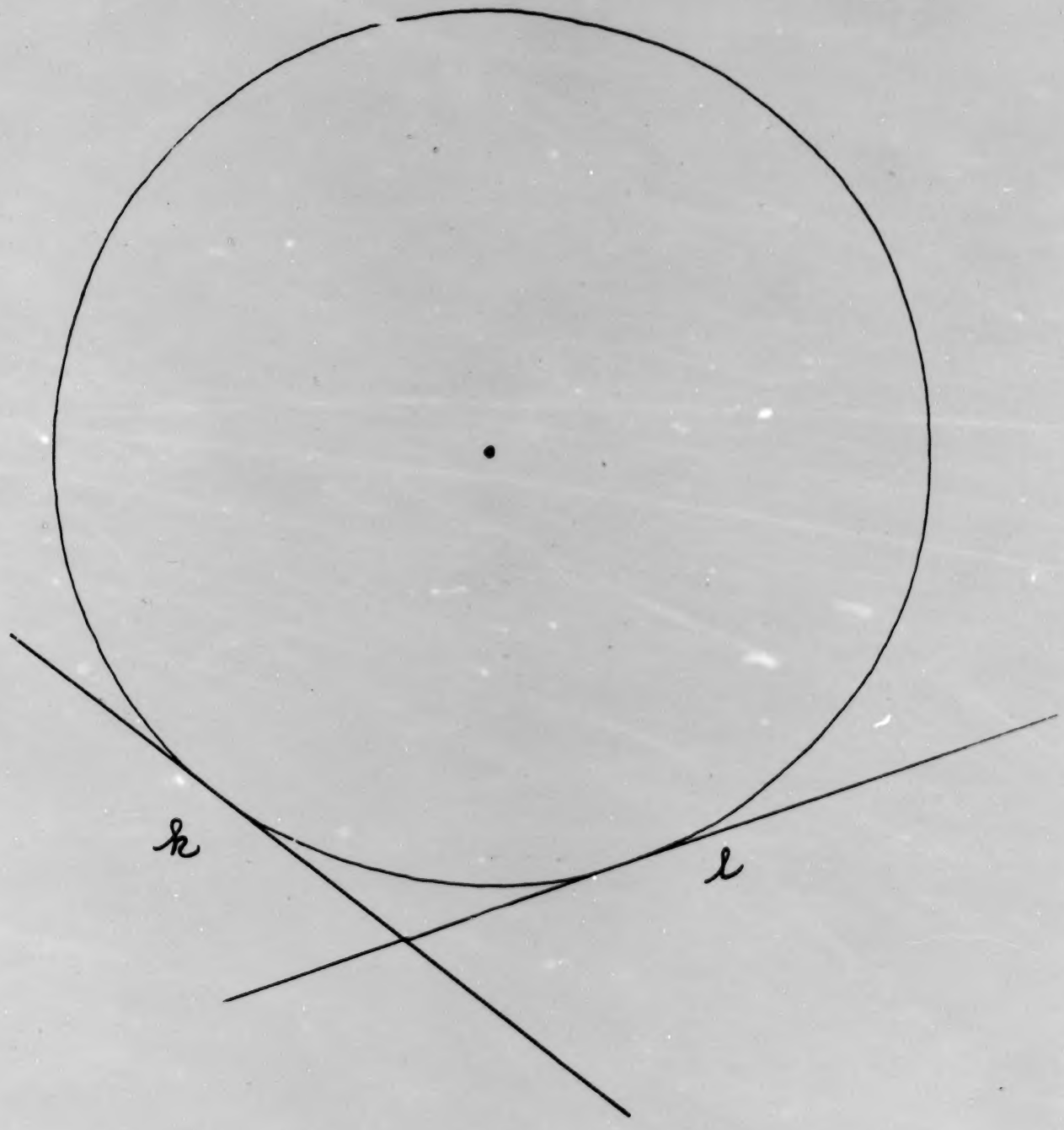
To draw an ellipse, place two pins or stakes in place and tie a string loosely around them. Then place a pencil inside the loop and keeping tension on the string, move it around the two pins. By varying the distance between the pins and the sizes of the loop you will get different shaped ellipses. The long axis is called major axis and the short axis the minor axis.

WX - Major Axis
YZ - Minor Axis

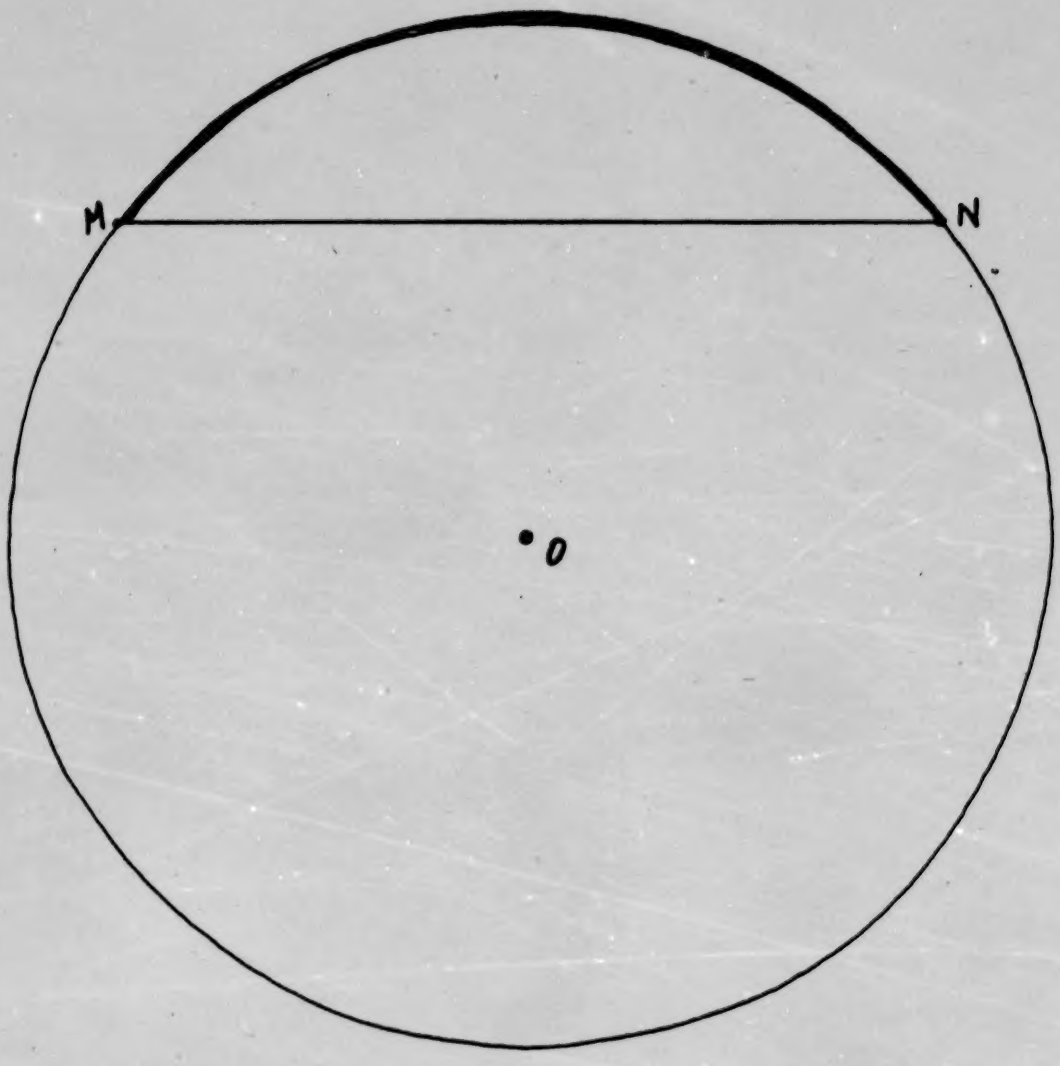
10-5-2 Transparencies


A
B
O
C


M
N
Q
O
P



236


M
N
O

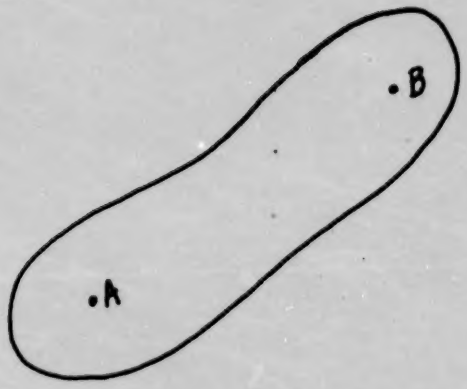


Fig. 1

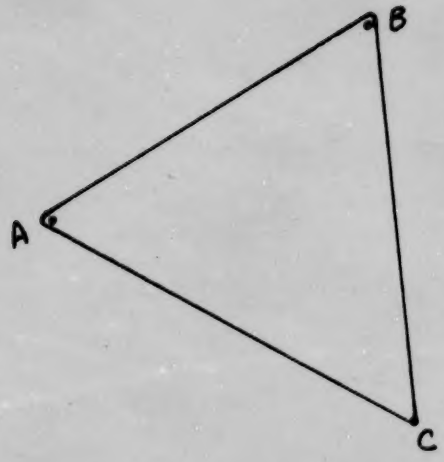


Fig. 2

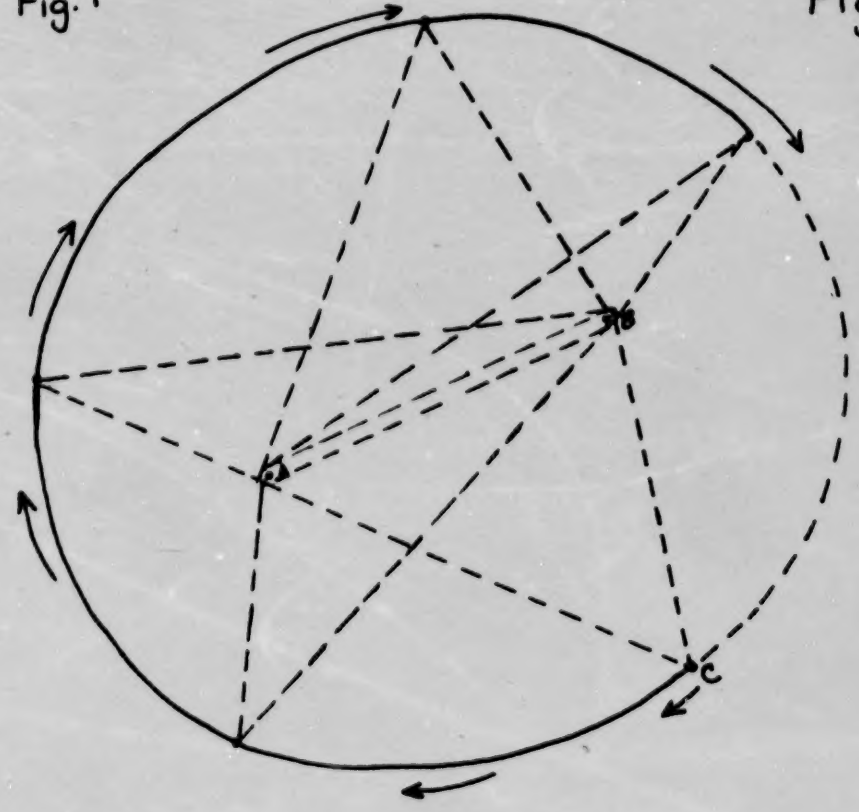
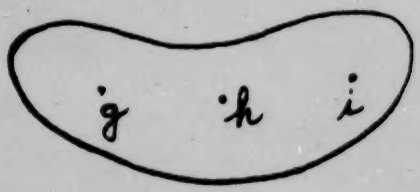


Fig. 3

10-5-3 Activity: Test your knowledge of the definitions by completing this activity. After you have finished, check your answer by using the study sheet.

1. Name all the diameters in the following figures.

2. List all the radii.



3. Name two tangents.

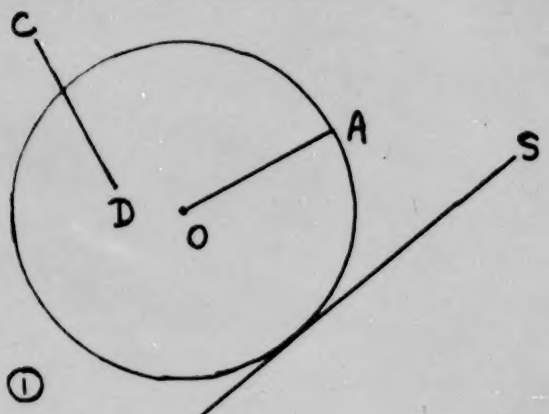
_____ _____

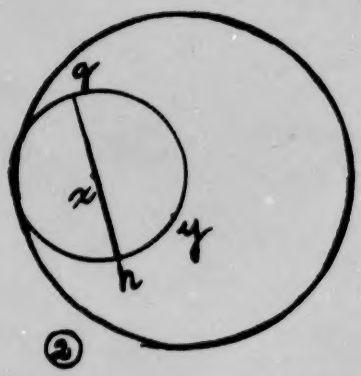
4. List three chords.

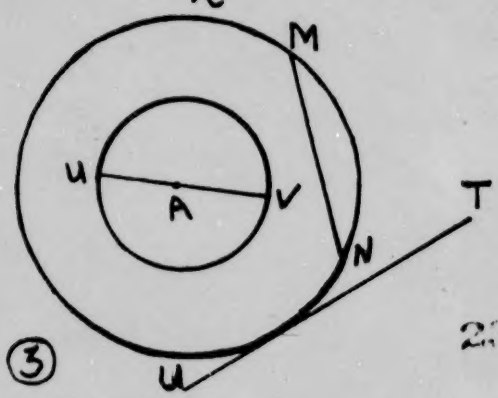
_____ _____ _____

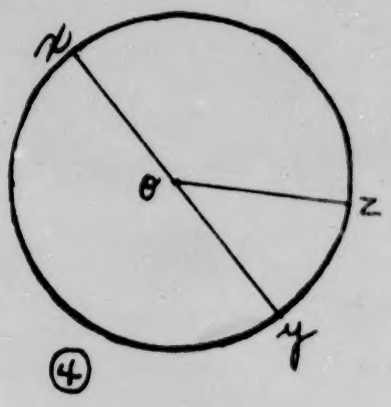
5. Which of the circles are concentric?

6. Label the ellipse & draw its major axis and minor axis. Label the major axis OP and the minor axis rs.









10-6-1 UNIT TEST: GEOMETRY

1. Draw the following line segments and bisect each segment using a compass.

   (a) 4 in. long
   (b) 2 1/2 in. long
   (c) 2 in. long
   (d) 1 5/8 in. long
   (e) 2 3/8 in. long
   (f) 2 in. long

2. Take a point outside any give line. Construct a perpendicular to the line from this point.

3. Draw line AB. Through a point outside this line construct CD parallel to it.

4. If 1 inch = 20 miles, what distance is represented by:
   (a) 6 in. (b) 4 in. (c) 2 1/2 in. (d) 3/4 in.

5. Construct the perpendicular bisector of a 3 inch line segment.

6. Draw a right angle and construct the angle bisector to this given angle.

7. Using a protractor draw the following angles and construct the bisector of each.

   (a) 30° (c) 45° (e) 130° (g) 55°
   (b) 60° (d) 25° (f) 160° (h) 70°

8. Using the scale 1 inch = 50 miles, draw line segment representing the following miles:

   (a) 100 miles
   (b) 150 miles
   (c) 175 miles
   (d) 25 miles
   (e) 50 miles
   (f) 75 miles

9. Draw an angle having the measure of 75° and construct an angle equal to it.

10. Construct an altitude to the following triangles.

    (a) Isosceles
    (b) Equilateral
    (c) Scalene

11. Draw circles with the following radii.

    (a) 1" (b) 3" (c) 1/2" (d) 1/4"

12. What is the measure of each angle of an equivalent triangle?

_____

13. What is the sum of the measure of the angle of a rectangle?

_____

14. Why can there be only one right angle or one obtuse angle in a triangle?

_____

15. Name the kinds of triangles according to sides and angles.

_____

_____

_____

INSTRUCTIONAL MATERIALS

10-0-0 Unit X: Geometry

10-1-0 Films

10-1-2 Film, #1014F

10-2-0 Points, Lines, and Planes

10-2-1 Filmstrip - Box 8

10-2-2 Transparencies

10-2-3 Study sheet

10-2-4 Activity sheet

10-2-5 Transparencies

10-2-6 Study sheet

10-2-7 Activity sheet

10-2-9 Study sheet

10-2-10 Activity sheet

10-3-0 Identification of Angles and Angle Measurements

10-3-1 Filmstrip, #643110

10-3-2 Framing square

10-3-3 Combination square

10-3-4 Miter box

10-3-5 Transit

10-3-6 Activity sheet

10-3-8 Activity sheet

10-4-0 Kinds of Polygons

10-4-1 Filmstrip

10-4-2 Transparencies

10-4-3 Transparencies and study sheet

10-4-4 Transparencies

10-4-5 Activity sheet

10-4-6 Study sheet

10-4-7 Activity sheet

10-4-8 Transparencies

10-4-9 Study sheet

10-4-11 Activity sheet

10-5-0 Circles, Areas, and Ellipses

10-5-1 Study sheet

10-5-2 Transparencies

10-6-0 Administration of Unit Test

10-6-1 Unit Test

10-7-0 Assignment of Special Projects

10-7-1 Special construction projects

10-7-1 Special Project

(1) Using cardboard boxes or any inexpensive material, construct a model house and model furniture.

(2) Arrange furniture in house.

(3) You may also use any other interior decorations.

GRADING CRITERIA

(1) creativity and originality

(2) neatness

(3) color scheme

(4) identification and classification of geometric shapes

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course _____ Teacher _____

Unit Title _____ Date _____

Beginning Date _____ End Date _____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

_____

_____

_____

_____

_____

UNIT XI
Personal Business

11-0-0 At the completion of this topic the house care student will demonstrate a knowledge of business used in everyday life by scoring 70% or better on a teacher-made test.

11-1-0 By use of lectures, demonstration and practice exercise, the house care service student will gain insight into everyday banking procedures.

11-1-1 Lecture and discussion of procedures for opening bank accounts and writing checks

11-1-2 Activity: Checking Account

11-1-3 Guest speaker, local banker or businessman to discuss advantages, conveniences, and services rendered by banks

11-2-0 The project teacher will use a guest lecturer and local wage scale to compute the total pay and take-home pay of workers in house care services.

11-2-1 Guest lecturer familiar with wages paid local workers. (Suggest a union representative)

11-2-2 Activity: Wages

11-2-3 Activity: Computing Deductions and Take-Home Pay

11-3-0 The project teacher will use lecture, activity sheet, and tables for amortized loans.

11-3-1 Lecture and discuss ways of financing a home

11-3-2 Activity: Financing a Home

11-3-3 Lecture and discussion on additional expenses for the home owner, such as: taxes, repairs, upkeep, depreciation, and insurance

11-3-4 Activity: Expense of Homeowner

11-4-0 By the State and Federal Income Tax Booklets, the student will learn to compute state and federal income tax.

11-4-1 Activity: Terms and Phrases Used in Computing Tax

11-4-2 Activity: State Income Tax

11-4-3 Activity: Federal Income Tax

11-5-0 The project teacher will use lectures, resource material, and interviews to find the cost of owning and operating an automobile.

11-5-1 Lecture and instructions for use of activity sheet. Assignment to interview parents and friends on the expenses involved in automobile ownership.

11-5-2 Activity: Cost of Operating and Maintaining an Automobile

11-5-3 Activity: Automobile Insurance

11-5-4 Activity: Maintenance and Operation of the Automobile

11-5-5 Guest automobile insurance agent

11-6-0 The project teacher will use library materials, interviews, and related materials to give the student practical experience in setting up a family budget and working with family finance.

11-6-1 Activity: Discussion Questions on Wise Buying and Budgets

11-6-2 The student will have three interviews with persons approved by the teacher to gain some insight into family finances.

11-6-3 The student will set up trial budgets for families with low, medium, and high incomes.

11-6-4 The student will prepare a written report to be given to the construction trades mathematics class expressing his ideal budget for an average size family of average income.

11-7-0 The project teacher will administer a teacher-made test on Personal Business.

11-7-1 Unit Test

11-5-3 Activity: Automobile Insurance

1. In order to study insurance there are several terms we need to define. With the aid of the dictionary and other resources, define the following terms:

   (a) Insurance
   (b) Premium
   (c) Liability
   (d) Collision
   (e) Comprehensive
   (f) No-fault
   (g) Deductible
   (h) Policy Limits (10-20-10)
   (i) Medical Payments
   (j) Uninsured Materials

2. Estimate the cost of Liability and Comprehensive Insurance for a person of your age. This may be done by talking with students who have insurance or by talking with an insurance representative. Use $3,000 for the cost of the car. Specify the policy limitations, liability and amount deductible on the collision.

   Liability_____ _____

   Collision_____ _____

3. What kind of insurance covers damage to your own car?

4. What kind of insurance covers damage to another car or to property for which you are legally liable?

5. What kind of insurance protects the car owner if he is held responsible for the death or injury of a person?

6. If you cannot afford all types of automobile insurance, which ones are most important? Why?

7. Does an insurance company ever refuse to sell an individual insurance on an automobile that is in good condition? Explain your answer.

11-1-2 Activity: Checking Account

Obtain checks, deposit slips, signature identification card and any other pertinent information needed to open a bank account. Open the bank account by filling out the identification card and depositing $500.00. Keep a record of checks, running balance, deposits, etc., for the following:

June 1	Deposit	$ 500.00
	Car note (Citizen Bank)	75.00
	Cash	15.00
June 2	River Front Service Station	6.50
	Dairy Queen	3.45
June 4	City Auto Supply	18.59
	Circle Cafe	4.20
June 5	School Cafeteria	3.30
	Live Oak Grocery	45.28
June 7	College Cleaners	7.31
	University Sounds	10.40
June 10	Town House Restaurant	8.35
	Joe's Men Store	32.25
June 12	Demon Grill	1.75
	Southern Phone Co.	11.65
June 14	City Utilities	25.60
	Deposit	150.00
June 20	Westlake Service Station	8.30
	Harry's Parts Co.	14.25
June 22	Stan's Recording & Tape	42.50
	Kentucky Fried Chicken	2.95
June 25	Sids Flower Shop	4.50
	City Barber Shop	2.25
June 27	P & C Drug Store	8.75
	Cash	15.00
June 30	Service charge	2.10
July 1	Deposit	500.00
	Car note (Citizen Bank)	75.00
	Tri-State Ins. Co.	70.00

July 2	Cash	40.00
	Big Chain Grocery	35.00
July 3	Jim's Jeans	16.75
	Sears	12.75
July 5	P & C Drug	14.35
	Demon Grill	2.75
July 6	Goodyear Tire Co.	82.40
	College Cleaners	8.75
July 7	Bill's Dollar Store	15.80
	Westside Exxon	6.40
July 8	Kentucky Fried Chicken	3.85
	Cash	25.00
July 10	Deposit	150.00
	Stan's Recording & Tapes	8.70
July 11	City Barber Shop	2.25
	Pats Economy	3.25
July 13	Big Chain Grocery & Market	25.82
	College Book Store	15.95
July 15	Cash	10.00
	Sibley's Grocery	5.65
July 17	Doug's Steak House	13.42
	Joe's Flower Shop	4.80
July 20	Bole's Drug Store	10.15
	Cash	25.00
July 23	Deposit	200.00
	City Barber Shop	2.25
July 25	University Sounds	18.65
	Jim's Jeans	7.69
July 27	Westside Exxon	12.50
	Carters Watch Repair	7.50
July 29	Town House Restaurant	15.20
	Cash	25.00
July 31	Deposit	50.00
	Service charge	1.80

11-2-2 Activity: Wages

Compute the total wages for each worker. Overtime (hours over 40 a week) worker is paid time and a half.

	Hours Worked	Hour Wage	Weekly Pay
1.	30	$4.50	_____
2.	40	5.25	_____
3.	25	6.75	_____
4.	46	2.75	_____
5.	38	4.50	_____
6.	25	4.60	_____
7.	40	3.65	_____
8.	50	6.50	_____
9.	30	6.25	_____
10.	44	5.50	_____

11. A small appliance repairman is paid $6.50 an hour and time and a half for all time over 40 hours. Find his total wages for the month of February if he worked the following hours:

1st week	32 hours
2nd week	48 hours
3rd week	48 hours
4th week	24 hours

12. A salesclerk whose hourly wage is $7.25 an hour works 32 hours one week and 24 hours the next week. How much did he get paid for the two weeks work?

13. Find the hourly wage if a seamstress receives $261.00 for working 36 hours.

14. Find the daily wages of a carpet cleaner who works 6 1/2 hours for $3.80 an hour.

15. An interior decoragor received $269.50 for working 46 hours. Find his hourly wage if he received time and a half for all hours over 40 hours.

11-2-3 Activity: Deductions

If the deductions are made, find the take home pay of the following:

Social Security Tax 5.85%*
State Income Tax 2%**
Federal Income Tax 14%

		Social Security Tax	State Income Tax	Federal Income Tax	Take Home
(1)	$160.00	_____	_____	_____	_____
(2)	140.00	_____	_____	_____	_____
(3)	200.00	_____	_____	_____	_____
(4)	170.00	_____	_____	_____	_____
(5)	375.00	_____	_____	_____	_____
(6)	500.00	_____	_____	_____	_____
(7)	450.00	_____	_____	_____	_____
(8)	370.00	_____	_____	_____	_____
(9)	280.00	_____	_____	_____	_____
(10)	215.00	_____	_____	_____	_____

* Note the percent of a person's salary deducted is set by congress. This is not necessarily the rate at this time.

** The amount deducted from one's salary for state and federal income tax varies according to the number of dependents claimed on the W-2 Form and the amount of his yearly earnings.

11-3-2 Activity: Financing A Home

To find the actual cost of buying a home we must add the amount of interest we pay to the selling price of the home. By using a Table to Amortize a loan, fill out the following:

	Cost of Home	Down Payment	Amount Financed	Number of Years	Monthly Payment	Total Monthly Payments	Total Payments	Total Interest
1.	20,000	4,000	16,000	20				
2.	20,000	5,000		20				
3.	20,000	6,000		20				
4.	20,000	8,000		20				
5.	20,000	10,000		10				
6.	20,000	4,000						
7.	20,000	6,000		10				
8.	40,000	10,000		20				
9.	60,000	20,000		20				
10.	60,000	20,000		30				

11. How much money can a buyer save by paying $8,000 down instead of $4,000 down on a 20 year loan for a $20,000. house?

12. What advantages is it to finance $14,000 for 10 years instead of 20 years? Why do most buyers finance for 20 years?

13. How much extra will it cost to finance $40,000 over 30 years instead of 20 years?

14. Find out which of the following would be the best way to finance a home.

Cost of Home	Down Payment	No. of years
$20,000	$5,000	20
$20,000	$4,000	10
$20,000	$6,000	30

15. Find which of the following would cost a home owner the least interest.

Amount financed	No. of years
$30,000	30
$30,000	25
$25,000	30

11-3-4 Activity: Expense of Home Owner

Home Owners Expenses:

I. Insurance
   a. Obtain brocheres and pamphlets on various insurance policies and study the different types of coverage available.
   b. Determine the cost of fire insurance for a $25,000 home in Natchitoches.
   c. Determine the cost of a home owners policy for a $25,000 home in Natchitoches
   d. Write a brief summary of the types of insurance for a home and give advantages to each type offered. State which policy you would like to have to insure your home.

II. Taxes: The amount of tax a property owner must pay depends on the assessed valuation of his property and the tax rate. The tax rate is of ten expressed in mills. A one mill tax is $1.00 tax for every $1000 of the assessed valuation.

Find the tax in the following:

Assessed value	Tax in Mills	Tax
1. $8,000	8	_____
2. $2,500	8	_____
3. $5,000	13	_____
4. $7,500	11	_____
5. $9,000	12	_____
6. $8,500	5.2	_____
7. $60,000	7.5	_____
8. $12,500	15	_____

9. The tax rate in Clarence is $4.72 per $100. If Mr. Jones property is assessed at $8,000, what is his tax bill?

10. The tax in Robeline is $12.62 for every $1000. If John Smith's property is assessed at $42,000, what is his tax?

11-4-1 Activity: Terms Used in Computing Income Tax

I. Define the following terms using the dictionary, and tax booklet.

1. gross income
2. net income
3. joint return
4. head of household
5. dependents
6. taxable income
7. standard deductions
8. itemized deductions
9. exemptions
10. assets
11. depreciation

II. Read and study the state and federal income tax booklet received annually.

11-4-2 Activity: State Income Tax*

Compute the state income tax on each of the following salaries for each situation listed below:

a. single
b. married, filing joint return
c. married, filing joint return with 2 additional dependents.

1. $5,000 income, contributions $500

2. $7,500 income, contributions $750, interest $400

3. $10,200 income, contributions $1000, interest $350

4. $18,500 income, contributions $1200, interest $500

*Obtain State Income Tax Form and Booklet from teacher.

11-4-3 Activity: Federal Income Tax*

Compute the federal income tax for the following:

1. John Smith, wife and three children have an annual salary of $8,750. His deductions were, interest on mortgage $450, taxes $350, contributions $8000.

2. Henry Owens, single, has a salary of $10,000. Deductions were taxes $325, contributions $400.

3. Harold Jones, married with two children, has an annual salary of $12,500, interest in Crods & Savings $425. His deductions are $850 interest, contributions $900, and taxes $300.

*Obtain Federal Income Tax Form and Booklet from teacher.

11-5-2 Activity: Financing the Automobile

Using an appropriate chart, compute the cost of a new car with the following information:

1. Cost of car $4,000
   Down payment $500
   Equal payment for 36 months
   Total cost for 3 years

2. Cost of car $4,500
   Trade in given
   a. payments for 36 months
      total cost for 3 years
   b. payments for 24 months
      total cost for 2 years

3. Price on used car $2250
   Down payment $250
   Finance remainder over--
   a. 36 months
      total cost
   b. 24 months
      total cost

11-5-4 Activity: Maintenance and Operation of the Automobile

1. Manufacturers suggest changing the oil and greasing the automobile every four months or 6,000 miles. For our purpose, we will consider that we will drive 18,000 miles per year. Grease, change oil and filter every 6,000 miles. Estimating that the car will get 14 miles per gallon, find the total cost of operating the car for the year, month, and the mile.

2. Using the same procedure as above, estimate the cost of operating a small economy car. The car will get 20 miles per gallon.

3. Find the cost per year and per mile of owning and operating an economy car with the initial cost of $2,750 and trade-in value, after five years, of $750.

4. Mary bought a car for $2,750. Car expenses for the first year were: gasoline and oil - $335; repairs and miscellaneous expenses - $47; insurance - $95; license plates - $6.50; interest on investment at 4%; and depreciation at 20%. Find the total operating cost for the year.

11-6-2 Activity: Budgeting

Select two persons from the following list to interview and discuss the family budget:

Home Economics Teacher	Counselor
Math Teacher	Housewife
Businessman	Minister
Librarian	

Suggested questions to ask:

1. Why should one budget?
2. What percentage of money should go for food, housing, clothing, contributions, recreation, etc.?
3. How should a budget be worked out?
4. Relationship of husband and wife in handling finances.
5. Discuss the advantages and disadvantages of budgeting.
6. Problems and difficulties that may arise if a budget is not used.
7. Advantages and disadvantages of buying on time or installment purchasing.

Keep notes from interview to be used in 11-6-2.

11-6-1 Activity: Discussion Questions on Wise Buying and Budgets

1. What is a budget?

2. Estimate the total time that you spent during the past five school days for each of the following:

   (a) recreation
   (b) sleep
   (c) meals
   (d) dressing and caring for clothes
   (e) leisure
   (f) homework
   (g) home tasks
   (h) school
   (i) miscellaneous

3. Do you think a time budget is as important as a financial budget?

4. Explain why budgets should not be figured to the penny, but should always allow for a miscellaneous fund.

5. Mrs. Gair pays cash for every purchase while her sister, Miss Jones, charges most of her purchases of household needs, clothing, and food. Which one do you think might have more trouble balancing a budget? Why?

6. Do you think it is important for children to know the financial limitations of the family budget for food, clothing, and recreation? Why?

7. How can a budget reduce or relieve financial worries?

8. What magazines found in most libraries contain information about food, clothing, and furnishings?

9. Make a collection of misleading advertising slogans used on radio, on televesion, and in magazines.

10. Discuss the importance of the following factors to the consumers:

    (a) buy now - pay later
    (b) famous brand names
    (c) store reputation
    (d) impulse buying
    (e) quantity buying
    (f) planned buying
    (g) special sales, such as post-season, white goods, and clearance sales

11-6-3 Activity: Setting Up a Trial Budget

Use the following incomes and draw up a budget. Figure the percent of income for each of the items. Use a circular draft to depict the outcomes.

A. $5,000.

B. $7,500.

C. $18,500.

11-6-4 Activity: Written Report

By using information gained while doing exercises 8-6-1 and 8-6-2, prepare a written report to explain your ideal budget for an average family and give your opinions of family finances.

11-7-1 UNIT TEST: PERSONAL BUSINESS

Determine the end of the month checking balance from the following transactions:

May 1	Deposit	$ 450.00
	Car Note	85.00
	Cash	50.00
May 10	Big Chain Grocery	25.00
	Tri-State Ins. Co.	35.00
	City Utilities	28.50
	Southern Phone Co.	8.60
May 15	City Barber	2.25
	Deposit	150.00
May 22	Town & Country Store	15.40
May 25	P & C Drugstore	8.95
May 28	College Cleaners	6.50
May 31	Service Charge	1.80

Compute total wages for each worker below. Time and a half is paid to workers working over 40 hours.

Hours Worked	Hour Wage	Total Wages
1. 35	$4.50	
2. 40	5.00	
3. 48	4.00	
4. 50	4.50	
5. 25	4.75	

Determine the total cost of each home listed below.

Amount Borrowed	Interest	Time
a. $20,000.	8%	20 yr.
b. 30,000.	7 1/2%	30 yr.
c. 45,000.	7%	45 yr.
d. 25,000.	8%	30 yr.

Compute the take-home pay for each situation below.

Social Security tax - 5.85%
State Income tax - 2%
Federal Income tax - 14%

Salary Per Week	Social Security Tax	State Tax	Federal Tax	Take-home Pay
1. 160.00				
2. 150.00				
3. 200.00				
4. 170.00				
5. 250.00				

Find the tax on each assessed value below.

Assessed Value	Tax in Mills	Tax
1. $7,000.00	8	
2. 2,400.00	6	
3. 5,000.00	5	
4. 8,000.00	4	
5. 9,000.00	12	

Define the following terms:

1. Gross Income
2. Net Income
3. Assets
4. Depreciation

Compute the cost and operation expense on the following car:

1. Cost - $6,000.
2. Down payment - $2,000.
3. Equal payments for 36 months

INSTRUCTIONAL MATERIALS

11-0-0 Unit XI: Personal Business

11-1-0 Teacher-made checks and stubs or ledger

11-1-2 Activity sheet

11-2-0 Guest lecturer and local wage scale

11-2-2 Activity sheet

11-2-3 Activity sheet

11-3-0 Tables for amortized loans

11-3-2 Activity sheet

11-3-4 Activity sheet

11-4-0 State and Federal Income Tax Booklets

11-4-1 Activity sheet

11-4-2 Activity sheet

11-4-3 Activity sheet

11-5-0 Resource materials and interviews

11-5-2 Activity sheet

11-5-3 Activity sheet

11-5-4 Activity sheet

11-6-0 Library materials and interviews

11-6-1 Activity sheet

11-7-1 Unit Test

Natchitoches Parish Schools

UNIT REVIEW SHEET

Course_____ Teacher_____

Unit Title_____ Date_____

Beginning Date_____ End Date_____

I. Time Spent on Unit

Objectives	Estimated Time	Actual Time	Date Completed	Comments

II. Objectives Covered

A. Covered all objectives: Yes _____ No _____

B. Objectives not covered:

Objective Number	Reasons

III. Appropriateness of Objectives, Activities, Materials, and Evaluation.

A. All objectives were appropriate: Yes _____ No _____

B. Objectives not appropriate:

Objective Number	Reasons
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

IV. Suggestions for Improving the Unit

_____

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